

NETWORK WORLD

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NOVEMBER 9, 1987

► COMDEX/FALL'87

IBM details OS/2 net support plans

Also unveils local network software.

BY MARY PETROSKY

West Coast Correspondent

LAS VEGAS — IBM used the Comdex/Fall'87 show here last week to unveil two new local network products and to announce the early shipment of the OS/2 microcomputer operating system, an advanced version of which will form the basis for IBM's future local network products.

The products, announced at a meeting where IBM revealed it has already shipped one million Personal System/2s, included the OS/2 LAN Server and a new version of

the PC LAN program.

The OS/2 LAN Server is designed to enable Personal Computers and Personal System/2s on an IBM Token-Ring or PC Network to share resources such as files and printers. Using special functions in IBM's OS/2 Extended Edition, the server can also emulate terminals and access larger computers. Version 1.3 of the PC LAN program will allow PC-DOS-based workstations to access the LAN Server.

Developed by Microsoft Corp., OS/2 is a multitasking personal computer operating system capable

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IBM commits to OS/2 timetable

December 1987
Standard Edition 1.0 — supports multitasking and allows users to run large applications

July 1988
Extended Edition 1.0 — adds relational data base support and communications functions that enable microcomputers to access larger systems

October 1988
Standard Edition 1.1 — adds windowing capabilities to Standard Edition 1.0

November 1988
Extended Edition 1.1 — adds windowing and local network support to Extended Edition 1.0

Delivery dates for Operating System/2 versions

SOURCE: IBM, ARMONK, N.Y.

► SNA NETWORKS

Big Blue readying agile FEP

Device to offer new network options.

BY PAUL KORZENIOWSKI

Senior Editor

RESEARCH TRIANGLE PARK, N.C. — At the behest of its largest customers, IBM is developing a communications processor that will eliminate SNA's current dependence on a central host processor and will support a broad range of equipment and networking schemes, *Network World* has learned.

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OPEN SYSTEMS: HOW OPEN ARE THEY?

OSI drives DECnet divergence

BY MARY PETROSKY

West Coast Correspondent

Digital Equipment Corp. is feeling its oats. Success of the company's VAX line and DEC's strategy of adhering to a single network architecture have cemented the firm's position as a major league com-

puter vendor. And following the adage that nothing succeeds like success, DEC is reluctant to change its formula.

DEC hit upon its winning mix of ingredients in the early '70s, when it set out to create a product line based on one computer architecture, one software system

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► DISCOUNT SERVICES

Users prod AT&T into new call plan

BY KARYL SCOTT

Washington, D.C. Correspondent

WASHINGTON, D.C. — Threatened with the loss of key accounts in the hotel

industry, AT&T has introduced a discount calling plan aimed at high-volume users of Dial 1 and operator-assisted long-distance service.

AT&T's Hospitality Network Service (HNS) pricing plan, which discounts AT&T's Message Telecommunications Service, was filed with the Federal Communications Commission on Oct. 26 and is scheduled to take effect Jan. 1.

Although AT&T targeted HNS at the hotel industry, universities and hospitals are also potential customers, said Mark Sinclair, AT&T national market manager for the lodging industry.

"HNS is designed to meet the particular calling needs of hotels, hospitals and universities — traffic aggregators who resell service to their customers and who generate a high volume of operator-assisted calls," AT&T's tariff filing said.

According to Robert Ranalli, AT&T vice-president of consumer markets, the decision to offer HNS was driven by customers. Four major AT&T hotel accounts

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NETWORK LINE

News

► Centrex is alive and well, say satisfied users at the National Centrex Users Group meeting in Ann Arbor. Page 2.

► A record crowd of more than 100,000 turns out for Comdex/Fall'87, where vendors unleash a volley of LAN products. Page 2.

► Novell enhances its NetWare operating system and announces an alliance

with Oracle Corp. Page 2.

► The MNP vs. LAP battle spills over to the aisles of the Comdex show, as the two camps try to rally support for their error-checking protocols. Page 4.

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► Assistant U.S. Attorney General Charles Rule proffers the Department of Justice's opinions on the deregulation of the telephone industry in an exclusive *Network World* interview. Page 39.

► MERRILL LYNCH

Broker building PS/2 net empire

Firm to network 17,000 micros.

BY PAULA MUSICH

Senior Editor

NEW YORK — Merrill Lynch last week revealed details of a networking project that calls for the installation of 17,000 IBM Personal System/2s linked to Token-Ring Networks and a wide-area network, giving financial brokers in some 500 branch offices access to mainframe applications and live stock market information.

The project has taken a dramatic shift since its inception several years ago, when it was initiated to provide Merrill Lynch brokers with financial data via satellite.

Merrill Lynch, Pierce, Fenner & Smith, Inc. entered into a joint venture with IBM, dubbed Imnet, to develop that market information system, which the pair hoped to market to other firms. But the venture was dissolved early this year because of financial problems.

Merrill Lynch has now teamed up with Automatic Data Processing, Inc. (ADP) to develop a customized market quotation service for the financial services firm. Brokers

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► NATIONAL CENTREX USERS GROUP

Centrex users meet in first national confab

BY BOB WALLACE
Senior Editor

ANN ARBOR, Mich. — The first meeting of the National Centrex Users Group, held here last week, drew more than 200 users, representatives from all seven regional Bell holding companies and various equipment vendors, demonstrating industrywide commitment to a service that many had written off a few years ago.

Those attending the meeting, held at Domino's Pizza, Inc.'s world headquarters, praised recent Centrex service enhancements that extend some system management control to users. But attendees also noted that Centrex still needs a method of billing users in a more

timely fashion.

Attendees representing companies such as CNA Insurance Co., Bechtel Power Corp., Domino's Pizza, Rexnord Data Systems and Federal-Mogul Corp. said they already use or have plans to use a Centrex capability that allows them to reduce service costs by doing station moves, adds and changes from a terminal at their site.

Jim Yeip, a telecommunications analyst with the Information Resource Management group of Federal-Mogul in Southfield, Mich., said the ability to administer moves and changes constitutes a major step forward. "I want the best of both worlds," he declared. "I want Centrex, and I want more control of the central office

switches. I want to control my own destiny."

Muriel Sykes, a member of Bechtel's San Francisco Telephone Services Group, said the ability to perform moves, adds and changes from a terminal is necessary for companies such as hers that are trying to manage change. "Our main office in San Francisco has 6,000 lines of digital Centrex, and we increase and decrease our staff size at the drop of a hat," she said.

National Centrex Users Group Chairman Richard Jenifer, a consultant with CNA Insurance, said he already uses a terminal to administer station changes. "I can do one in as little as 15 to 20 minutes," he said.

CNA pays a one-time charge, which Jenifer said covers the central office switch software necessary to use the feature, and a monthly maintenance fee that enables the company to perform an unlimited number of changes.

Jenifer said very few of
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► COMDEX/FALL'87

Comdex: LAN wares steal show

Vendors unveil slew of net tools.

BY JIM BROWN
New Products Editor

LAS VEGAS — A bevy of local network products were among the wares released here at Comdex/Fall'87, the annual microcomputer industry show, which officials said had a record turnout of 100,000 attendees.

Among the pack was Berkeley, Calif.-based Tops, a Sun Microsystems, Inc. company. Tops released TOPS/Sun Workstation software that enables a Unix-based Sun-3 workstation to act as a file server for IBM Personal Computers and Apple Computer, Inc. Macintoshes attached to an AppleTalk network running TOPS.

The software runs in conjunction with a Kinetics, Inc. FastPath gateway, which provides the physical link between Sun-3 workstations supporting Sun's Network File System network and the TOPS network. With the software, personal computers and Macintoshes are able to access files stored on Sun workstations and to store files on a Sun workstation disk.

The software also enables Sun workstation users to access files on personal computers or Macintoshes. TOPS/Sun Workstation costs between \$895 and \$2,495, depending on the number of personal computers or Macintoshes that will access the Sun workstation.

Unisys Corp. of Blue Bell, Pa., released an enhanced version of its Usernet local network operating system for its Usernet adapter board. The new version, dubbed Usernet2, supports a 4M bit/sec token-ring topology. It will link IBM Personal Computers, Personal System/2s and Unisys' Personal Workstation2s, also announced at the show. The new software supports Usernet's existing twisted-pair wire star topology.

The new version also includes an Asynchronous Communications Server module, which enables Usernet2-attached devices to appear to an asynchronous host as a Digital Equipment Corp. VT-100 or VT-220 terminal operating at up to 9.6K bit/sec.

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► LOCAL NETWORKS

Novell widens NetWare capabilities

BY MARY PETROSKY
West Coast Correspondent

LAS VEGAS — Novell, Inc. last week announced new capabilities for its NetWare network operating system and an alliance with relational data base management system vendor Oracle Corp. aimed at making it easier for users to develop local net applications.

Novell also announced it will provide NetWare compatibility with IBM's OS/2 Standard Edition operating system (see "IBM details OS/2 net support plans," page 1) in the first quarter of 1988. That means personal computers running OS/2 Standard Edition will work in NetWare-based local networks.

Novell said IBM will provide technical and programming assistance in making NetWare compatible with OS/2 Standard Edition. NetWare Support Package for IBM OS/2 will be available for NetWare 2.1 users and will not require an operating system upgrade.

At Comdex, Novell said it will begin integrating Btrieve, a set of programming subroutines for data base access and management, into NetWare. Separately, the firm said it would work with Oracle to port Oracle's personal computer-based data base management products to NetWare local nets.

With these announcements, Novell expressed its intention to make available more programming tools to users for the development

of local network applications, including distributed data bases. The availability of such tools will help make personal computer networks comparable in functionality to minicomputers and even mainframes, said Craig Burton, senior vice-president of corporate marketing and development for Novell.

Beginning this quarter, Novell will be integrating Btrieve into NetWare 2.1. Adding Btrieve gives NetWare indexed file-retrieval capabilities found in minicomputer and mainframe operating systems, Burton noted.

Because Btrieve consists of pre-written code that performs file management and security functions, such as file and record locking, developers can cut programming time by incorporating Btrieve subroutines instead of writing such file management functions themselves. Btrieve supports programming languages such as BASIC, Pascal and C, as well as many operating systems, including MS-DOS, Xenix, NetWare and the IBM's PC LAN Program.

Btrieve will be integrated into
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Rochester General Hospital embarks on a rewiring project intended to support an information system upgrade. **Page 23.**

NEW PRODUCTS AND SERVICES

The Comdex/Fall'87 show provides a forum for the introduction of local net bridges and other products for IBM's Personal System/2. **Page 27.**

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Correction: In the article "Bank untangles network mess" (NW, Sept. 21), John P. Macri's name was incorrectly spelled. Macri is vice-president of technology asset management at Bank of America National Trust & Savings Association.

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► COMDEX/FALL'87

Protocol war heats up

Firms split on error-checking standard.

BY JIM BROWN
New Products Editor

LAS VEGAS — The battle over which error-checking protocol should be incorporated in developing international standards for point-to-point dial-up modems spilled over to the show floor at Comdex/Fall'87 here last week.

There were two camps here trying to rally support for their protocols — the Link Access Procedure (LAP) protocol and Microcom, Inc.'s Microcom Network Protocol (MNP).

Proponents of a LAP-based method argue LAP will yield the enhanced error-checking techniques needed as modem speeds increase. MNP backers say any standard needs to address the large installed base of modems already using MNP.

The battle took on new proportions when the Consultative Committee on International Telephony and Telegraphy's Study Group XVII said last month it will consider including both a LAP-based method and MNP in its recommendation for error-checking in asynchronous modems that transmit synchronous data packets.

At Comdex, Hayes Microcomputer Products, Inc.'s efforts to urge the CCITT to give more weight to a LAP-based method were bolstered when CompuServe, Inc. and West-

ern Union Telegraph Co. announced they would install Hayes' 9.6K bit/sec V-series Smartmodem 9600s in their respective packet-switched networks. The announcements mean customers of CompuServe and Western Union have the option of using a V-series modem, which supports a Bit-Oriented LAP (LAP B) error-checking scheme, to access the firms' networks.

On the other side of the show floor, Microcom continued to push for its MNP error-checking scheme, which is used by Tymnet/McDonnell Douglas Network Systems Co., Telenet Communications Corp., IBM's Information Systems Network and General Electric Information Services Co.

Protocol prattle

Although both Hayes and Microcom are campaigning for different protocols, modem vendors here said one does not have a clear technical advantage over the other. Most vendors said the debate is nothing more than a marketing war that confuses users.

"This is not a battle we feel is worth fighting. We'll just give our customers whichever error-checking method they want," said Richard Clanin, director of modem marketing for Cermetek Microelectronics, Inc.

Cermetek currently offers both LAP B and MNP as options to its

line of 9.6K bit/sec modems.

Existing LAP B and LAP D protocols are based on the International Standards Organization's High-Level Data Link Control protocol. LAP B is used for error-checking on X.25 packet-switching nets. LAP D is the CCITT's recommendation for signaling on Integrated Services Digital Network's D channel.

Vendors said the CCITT study group is considering creating a modified version of LAP D, known as LAP Modem (LAP M). Eventually, LAP M and/or MNP will be included in the CCITT's V.42 modem recommendation.

Should CCITT include both methods in its recommendation, one would be named a primary method and the other a backup. The recommendation, vendors said, could also include a feature that enables the sending modem to switch to the backup method if that is all the receiver supports. Otherwise, the primary method would be used.

The protocol named as the fallback method may actually be phased out over time, vendors said.

Hayes argues that, since documentation for existing LAP protocols is more widely available than MNP documentation, developers will find it easier to implement a LAP-based method.

Such a LAP-based method would allow users to migrate to dial-up X.25 packet-switching and ISDN services more easily, said Gary Betty, senior vice-president at Hayes. MNP was written for Mi-

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► DATA COMMUNICATIONS

New York on the hunt for statewide T-1 net

BY MARY PETROSKY
West Coast Correspondent

ALBANY, N.Y. — The New York State Office of General Services has put out a request for proposal for a T-1 backbone network that will complement a citywide digital network recently installed here at the state capital.

Both the statewide T-1 backbone and the Albany network are designed to provide more control over costs and network operations, according to John Heinsohn, director of telecommunications for the Office of General Services. The Albany network alone is expected to save the state \$40 million over the next 10 years, Heinsohn said.

In its statewide network RFP, the state is looking to consolidate approximately 20 separate, but overlapping, data networks that cost more than \$20 million annually, Heinsohn said. The proposed T-1 network will be used primarily for data.

One advantage of operating its own T-1 network is that the state will be able to split the high-capacity bandwidth as needed, breaking

the T-1 line, for example, into numerous 9.6K bit/sec links. "There are many things we'll be able to do that would present operational problems if we tried to do them under a common carrier," he added.

The T-1 RFP calls for provision of end-to-end service, including circuits, hardware and a network control center. More than 30 vendors have picked up the RFP, including GTE Telenet Communications Corp., AT&T, US Sprint Communications Co., MCI Communications Corp., Nynex Corp., IBM, Digital Equipment Corp. and Data General Corp., Heinsohn said. He expects some vendors to form partnerships to respond to the RFP.

AT&T was able to win the earlier Albany network contract, signed in 1985, by meeting the state's technical requirements and offering the lowest cost solution, Heinsohn said. This network in the state capital, known as the Capital Network Telecommunications (CAPNET), connects 59 buildings across Albany and handles both voice and data traffic.

Cut over in July, CAPNET includes 617 miles of fiber-optic ca-

ble and 47,000 miles of copper wire. It supports 32,000 users. All cable is owned by the state and run through state-owned conduits.

The RFP for CAPNET was put out in 1982. Microwave is used to tie in several leased buildings or those in which the number of users does not justify running fiber-optic cabling, Heinsohn said.

In putting CAPNET together, AT&T supplied six System 85 digital private branch exchanges, 24 Information Systems Networks (ISN) and four digital microwave radios. The entire system cost approximately \$30 million; \$25 million was spent on the base switching system, and another \$5 million was spent on items such as conduit, ISN packet switches and additional fiber-optic cable, Heinsohn said.

The city network replaces Centrex services, which Heinsohn said were no longer cost-effective.

The state was paying Centrex line charges and more than \$6 per month per line for in-building wiring. In all, the state was laying out \$12 million annually for hardware and circuits, Heinsohn said.

With the new voice and data network, the state expects to save \$4.5 million annually for the first five years and \$6 million annually after that. Once the equipment is paid for, Heinsohn said he expects to have only maintenance costs.

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SWITCHING STRATEGIES

User dumps PBX for NY Tel Centrex

Hospital swaps Rolm gear for Intellipath II digital service.

BY BOB WALLACE
Senior Editor

BAY SHORE, N.Y. — New York Telephone Co. last week announced a contract with Southside Hospital here for a 1,100-line Intellipath II digital Centrex to replace a Rolm Corp. private branch exchange, the first hospital PBX-to-Centrex conversion in the company's territory.

The Bell operating company said the signing of Long Island's largest community hospital constitutes a victory in the ongoing competition between premises-based telephone switches and BOC central office-based systems.

Bob Jewels, hospital vice-president, said the cost of Centrex service was less than that of PBXs bid by several vendors. He emphasized, however, that this was only one of numerous reasons for the change. The inability to upgrade the Rolm LCBX, the need for a reliable system and the ability to cut the cost of station moves, adds and

changes were also key factors.

"The cost of the air-conditioning and electricity, switch insurance and a yearly service contract was more than the cost of Centrex service," Jewels said.

The BOC's Centrex rate-stabilization plan, which guarantees a fixed cost for the service, depending on contract length, also was appealing.

"The Intellipath II service does not require the large capital outlay that the purchase of a PBX would," Jewels said. Repeated switch outages also worked in favor of Centrex. "Our 940-line switch was partially out of order several times a year," Jewels said. "When lives are hanging in the balance, the telephone system has to work."

At one point, reliability problems with the Rolm switch forced Jewels to buy and install a Mitel Corp. SX-20 PBX to handle 50 telephone stations when the LCBX was not fully operational, he explained.

The hospital vice-president said the unavailability of upgrades to the old Rolm switch made the need for a new telephone system critical. Jewels said Rolm bid a CBX 9000 this summer, but would not provide information concerning IBM's 9751 CBX, which was not announced until early October. "Had [IBM/Rolm] told us about the new switch, it would have affected, but may not have changed, my decision."

Jewels said he met with top IBM/Rolm management after the contract was awarded to the BOC. "They wanted to know why they lost the account. We mentioned their earlier denial that the IBM switch was to be announced in the fall."

Jewels also said the cost of moving, adding and changing telephone stations helped seal the deal. Using an on-premises terminal, Jewels will be able to administer system changes easily. Jewels said he will pay New York Telephone a one-time charge of \$7,000 and a \$130 monthly fee for the ability to perform an unlimited number of moves, adds and changes. The hospital said its PBX switch service contract cost \$60,000 in 1987.

Southside Hospital, Jewels said, simply outgrew its PBX. "Our requirements surpassed its call-handling capabilities," he said. □

Centrex users meet

continued from page 2

the telephones in CNA's headquarters facility, which has roughly 5,000 analog Centrex lines, stay in the same spot.

Users also claimed they wanted a capability commonly referred to as on-premises station message detail recording (SMDR). While PBX users can routinely print out call data collected by their switches to determine facility usage and how to bill back end users for calling services, Centrex users have to wait for monthly reports from their local telephone companies.

The on-premises SMDR feature, which RBHCs such as BellSouth Corp. claim they plan to offer, would allow the RBHCs to pass call data from the central office to the customer premises. This information would be channeled into a local computer, processed and printed out in report form.

Under the current billing scheme, Bell operating companies provide users with a

magnetic computer tape containing call data, which the user either passes along to a service bureau for processing or processes in-house. Either step can add days or weeks to this billing process.

"It takes a few days to receive the tape," explained Chris Davis, vice-president of telecommunications services for Rexnord Data Systems in Milwaukee. "By the time it arrives, the information is often a month old. Then we give it to data processing to process," he said. "It would be more cost-effective for us to spend \$20,000 to \$30,000 for an on-site, deluxe SMDR system that would take the data off a line from the central office switch and process it."

Dan Gonos, a project manager with Domino's Pizza, echoed Davis' comments on the current billing process. "We need to receive this data in real time. The fact that we don't get final call data until 30 to 60 days after calls were made makes managing billing impossible," he said.

CNA's Jenifer said the current billing system

makes detection of errors next to impossible. "There are always errors on the tapes, but we don't find them until two or three months later," he said.

Although Centrex service billing irked many users, several of the same users spoke favorably of the virtues of citywide Centrex. Paul Kirvan, head of Paul F. Kirvan & Associates, a Turnersville, N.J.-based communications consulting and planning firm, explained that such a service would enable Centrex end users served by one central office switch to communicate with locations served by a different switch across town. Multiple central offices could be connected to one another with dedicated facilities.

Users said citywide Centrex would enable them to create a uniform dialing plan for several different Centrex locations. "If one of our pizza stores was being blitzed, while one downtown was having a slow night, the people at the first store could call to the other store much faster," Domino's Gonos explained. □

Protocol war heats up

continued from page 4

crocom by Greg Pearson, the firm's vice-president of technology planning. Its only use is error-checking in synchronous point-to-point transmissions. With a LAP-based protocol, personal computer users would be able to support multipoint connections.

Microcom still pushing

Microcom continues to push for adoption of MNP to protect the more than 300,000 current MNP users, Pearson said.

"I'd say the LAP approach would be the right one if MNP had not been invented," he said. "But, with so many MNP modems already installed, why start all over again with a new protocol?"

In support of Microcom's position, Casey Cowell, president of U.S. Robotics, Inc., said, "MNP should be included in the CCITT recommendation because frankly, I don't see MNP's large installed base going away." Cowell's firm, which supports only MNP, joined with Microcom to urge CCITT Study Group XVII to adopt MNP.

Because LAP B is used in X.25 packet-switched networks and LAP D is used in ISDN, users may enjoy more connectivity options with a LAP-based protocol

than with MNP, according to Hayes' Betty.

"We're not anti-MNP. We're LAP supporters," he continued. Hayes saw a growing use of dial-up lines used to access X.25 networks and chose to implement LAP B to support the trend and provide a migration path to further X.25 connectivity from personal computers, Betty said.

Pearson disputed the increased connectivity claim, however. He said that, because X.25 uses LAP B and a point-to-point modem connection would use LAP M, there would be an incompatibility in trying to access a packet network from a device supporting LAP M.

Because CCITT's recent recommendation would freeze MNP as it exists today, Betty said it would be easier to fold advanced error-checking techniques into a LAP-based protocol. This could include a 32-bit cyclic redundancy check (CRC) to replace the 16-bit CRC used in MNP, which tends to degrade as modem speeds increase.

Despite the controversy, modem makers say they will do one of two things: support CCITT's recommendation or support whatever the buying public demands. □

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Users prod AT&T to new call plan

continued from page 1

threatened to abandon AT&T to take advantage of more attractive long-distance rates offered by other carriers, a move that could cost AT&T \$118 million in revenue in 1988, Ranalli said.

Marriott Corp. is one of those accounts. "Marriott cannot ignore the cost savings that would be realized by subscribing to AT&T's competitors," according to Duane Heidel, vice-president for telecommunications at Marriott. "We've informed AT&T that, unless it can offer an attractive competitive response to the lower switched service rates, Marriott will move to other vendors."

AT&T provides service to approximately 11 of the largest hotel chains in the U.S., Sinclair said. Those clients include Holiday Inn Corp., Hyatt Corp., Ramada Corp., Hilton Hotel Corp. and ITT-Sheraton Corp.

Hotels traditionally use WATS-, Pro America- and Megacom-type high-volume services for both ad-

ministrative use and for hotel guests. The hotel resells these service to hotel guests, usually at a substantial profit.

The HNS pricing plan

Under the first component of the HNS pricing plan, the hotel will pay 18 cents per minute for MTS calls if it guarantees AT&T four million minutes of traffic per month for one year. Eighteen cents is "about 14% below the effective price for the mix of AT&T services customers most frequently use for long-distance 'Dial 1' calls," according to AT&T's tariff.

The second component of the HNS plan involves operator-assisted calling. The hotel will receive a 5- to 30-cent per minute commission from AT&T if it delivers four million minutes of operator-assisted calls to AT&T per month, for one year.

This means that, whenever a hotel guest dials 0 to place a credit card call or any other call involv-

ing operator assistance, the hotel will route that call to AT&T rather than to another carrier or specialized service provider.

A new HNS subscriber will pay a one-time \$100 service fee and \$10 charge per subscriber location to initiate service. In addition, HNS carries a \$360,000 monthly service charge, in addition to the 18 cents per minute traffic-sensitive charge.

"The advantage of HNS is that a hotel chain can aggregate all its traffic from multiple locations to achieve the eight million-minute usage requirement," said industry consultant Robert Ellis, president of The Aries Group, Inc., in Rockville, Md. "You can't aggregate traffic from multiple locations with WATS or Megacom."

HNS provides the customer with a single bill detailing telephone use from each subscriber location, thus eliminating the need for a telephone management and billing system at each individual hotel.

"This feature is going to save customers from having to invest in hardware and software to do detail

call accounting, not to mention the personnel costs," said Jerry Harder, manager of market analysis at Telco Research in Nashville, Tenn.

HNS is competitive with similar pricing options now offered by MCI Communications Corp. and ITT Corp. and may help AT&T retain the customers who are now threatening to change carriers, AT&T said in its filing.

Marriott, which uses AT&T Megacom, WATS and Pro America to provide hotel guests with long-distance service, has been approached by AT&T competitors offering services at prices substantially lower than AT&T's, Heidel said.

The hotel chain has also been offered a 15% monthly commission on operator-assisted calls from numerous alternative operator service providers, a potential source of new revenue that is hard to ignore, Heidel said.

"HNS is essential to improving AT&T's ability to meet marketplace competition. It's directly responsive to the offerings of AT&T's major competitors," Ranalli said. ▢

Big Blue readying agile FEP

continued from page 1

The communications processor, which is expected to be unveiled in the fourth quarter of 1988, will handle all the routing functions currently performed by IBM hosts and will feature enhanced capabilities for supporting and managing large distributed networks, according to analysts and users familiar with IBM's plans.

Sources said IBM has met with its largest and most loyal users in the last few months seeking input on the product's design. An IBM spokesman said the company does not comment on speculation about future products.

The processor will support a variety of IBM communications products, including network management software, modems, multiplexers and protocol converters, and it will enable customers to build cohesive distributed networks.

The first model of the device is expected to support a wide range of communications devices and transmission methods, including Synchronous Data Link Control links, T-1 lines, X.25 connections, private branch exchanges, IBM's Token-Ring Network and asynchronous communications.

Support for a yet-to-be-announced 100M bit/sec IBM Token-Ring Network, 45M bit/sec T-3 transmission facilities and Integrated Services Digital Network interfaces reportedly will be added in future releases of the product.

IBM will move the network routing functions currently performed by VTAM on a host to the communications processor. "A major problem with IBM networks right now is that, whenever the host goes down, the entire network is down," said Atul Kapoor, vice-president at Kaptronix, Inc., a consulting firm in Haworth, N.J. "By moving VTAM's functions to the front end, a host may go down, but

the network will remain up."

By off-loading VTAM chores to a front-end processor, whenever one communications processor goes down, a second may step in and route information to the appropriate destination.

The communications processor will run a version of IBM's Network Control Program (NCP) that supports peer-to-peer networking. NCP is software that acts as an operating system for a front-end processor.

The software will support Advanced Peer-to-Peer Networking (APPN) functions so the communications processor will be able to route messages to a variety of other processors. In current Systems Network Architecture networks, applications rely on a central host to initiate a session. With APPN, a variety of devices, such as a communications processor, System/36, System/38 or host, will be able to initiate sessions. With a variety of devices capable of establishing sessions, SNA's current dependence on a central control point can be overcome.

Rather than being a focal point on an SNA network, the host becomes just a processing node, like a personal computer. Coupled with IBM's LU 6.2 protocol, the processor's networking capabilities bring SNA closer to being a peer-to-peer network, in which applications on any processor can initiate sessions on other processors.

NCP will include features to solve the management problems that distributed networks now pose. "Because there is a dearth of tools for managing distributed networks, large companies are holding back computer purchases, and the whole industry is stagnant," noted Eduardo Stecher, president of Communication Associates, Inc., a Natick, Mass., consulting firm.

Current SNA network management tools have a number of significant limitations. The products were designed for hierarchical networks and cannot easily send management information between nodes on a network. Second, managing an SNA network is labor intensive, and network operators often have to enter the same configuration information many times. Another problem is the host processing overhead required to collect network management statistical information. Often, the process of collecting the information interferes with other applications running on a host.

Stecher predicted the new communications processor will use SNA Distribution Services (SNADS), communications software that moves information from one point to another on a network. By adding SNADS capabilities to the communications processor, configuration information may move automatically from processor to processor, rather than being entered manually. Also, statistical information can be collected by the various communications processors and transmitted in a batch file to a central host, where it can be processed when there are free machine cycles.

Modems, multiplexers and protocol converters will be attached to the communications processor through integrated communications boards rather than through ports on stand-alone products. Since the boards will not require separate items such as chassis and power supply, Stecher predicted they will cost at least 20% less than current products.

IBM's largest customers are playing a key part in defining the product's design and capabilities. David Fenstermaker, formerly a network manager at a large California bank, wrote part of a white paper that outlined features the device should contain. His work

was combined with work done by other members of Share, an IBM users group. At its annual meeting in San Francisco last March, Share presented the paper to IBM.

Analysts reported the company has already developed the hardware needed to support the device's broad range of functions. The chief hurdle will be the time needed to develop software to support the various functions. A prototype model is expected to be delivered to the first beta site in the next two months. Additional test runs are scheduled in the first quarter of 1988.

Rather than looking at the product as a response to traditional communications processor vendors such as NCR Comten, Inc. and Amdahl Corp., analysts said the device is the key part of a plan to position IBM to reap substantial revenue growth from its communications products in the 1990s.

The company realized that users want to run a broad range of networking protocols. Rather than buck that trend, IBM is trying to position SNA as a utility network instead of a proprietary network, said Vince Barrett, vice-president at Gartner Group, Inc., a Stamford, Conn., market research firm.

In opening up its network architecture, IBM wants to protect the large investment made in developing its network products. The company decided to protect the backbone portion of SNA networks. "IBM views the backbone network as proprietary," noted Kaptronix's Kapoor. While the company has been making it easier for competitors to link their processors to SNA networks, communications processor vendors have found their job harder. IBM moved specifications that describe format identification, headers used to move information on a SNA network, from open to proprietary manuals. Thus far, IBM has refused to outline how APPN functions. ▢

Broker building PS/2 net empire

continued from page 1

currently get financial data through a service provided by Quotron Systems, Inc., which was recently bought by Merrill Lynch competitor Citicorp.

Merrill Lynch has undertaken the networking project to move information processing capabilities to workers in the remote offices. Currently, about 10,000 brokers use specialized Quotron terminals that provide access to Quotron's financial data service and mainframes at Merrill Lynch's data center here. The terminals are linked to local Quotron controllers that provide 3270 terminal-emulation capabilities. The mainframes house customer information and other applications.

The brokerage is planning to install Personal System/2s in the branch offices that will be linked to Token-Ring Networks, giving users access to applications and communications software running on servers. The servers will provide access to host systems via Merrill Lynch's T-1 backbone net and will receive stock market information from ADP hosts.

Although users will still access the mainframes for some functions, most of their processing will be done locally. Mainframe access will initially be provided through 3270 emulation, but Merrill Lynch intends to support LU 6.2 networking protocols eventually, according to Ritch Gaity, vice-president of advanced office systems.

"Our technical base is probably 12 to 15 years old. We're looking to give brokers a little bit more firepower and be able to distribute data and processing much closer to the user," Gaity said.

"It will also give us the ability to start building a new layer of business-oriented software to support very hungry end users: the financial consultants and all the service and operations areas of Merrill Lynch," he said.

By moving customer information processing out to the branch offices, the project will off-load the growing demand for real-time information from mainframe data bases. "Data base inquiries are now three million a day. That number a year or two ago was 1.4 million," Gaity said. "That just shows us there's a pretty big need for local applications."

Personal System/2 users will access applications and communications functions resident on three types of servers maintained on the IBM Token-Ring Networks. The servers, which will also be Personal System/2s, will include office automation servers, and file and communications servers running proprietary ADP and Merrill Lynch software.

Office automation servers will run Innovative Software, Inc.'s Smart Software System, an integrated application that runs on a network. These servers will also run print management software developed by ADP.

"The file server will have a unique data base structure that

will allow us to run cooperative software between the workstation and the server," Gaity said. Software on the file server will handle data requests from workstations and format them.

"That software will also work interactively with our hosts in New York as backup," he explained.

The communications servers will handle communications traffic and manage the office network. They will also provide access to Merrill Lynch host computers through the firm's wide-area network. In addition, the servers will provide access to ADP host com-

puters for financial information. "ADP is broadcasting the stock market ticker, which will be received on a satellite dish and transmitted through the communications server. The server will hold several thousand current prices of securities," Gaity said.

Access to hosts from both ADP and Merrill Lynch, as well as to local applications, will eventually be simultaneous, thanks to the multitasking and windowing capabilities of the Personal System/2. "We're going to try to integrate what ADP offers in terms of dynamic market data with our own internal proprietary systems," Gaity said.

"This will allow the financial consultant to be in touch with the

market and look up an opinion on a particular stock or a customer's holdings at the same time," he said.

Merrill Lynch's existing wide-area network, which will also evolve to support the project, is a T-1 backbone network that includes several major nodes across the country. Local offices run leased lines into the nearest node, which then routes traffic to the backbone.

"That's what the ADP system will plug into," Gaity said.

Gaity said Merrill Lynch plans to install a pilot system in the first half of 1988 and then begin a roll-out three months later. Installation in 500 locations is expected to take 2½ years. □

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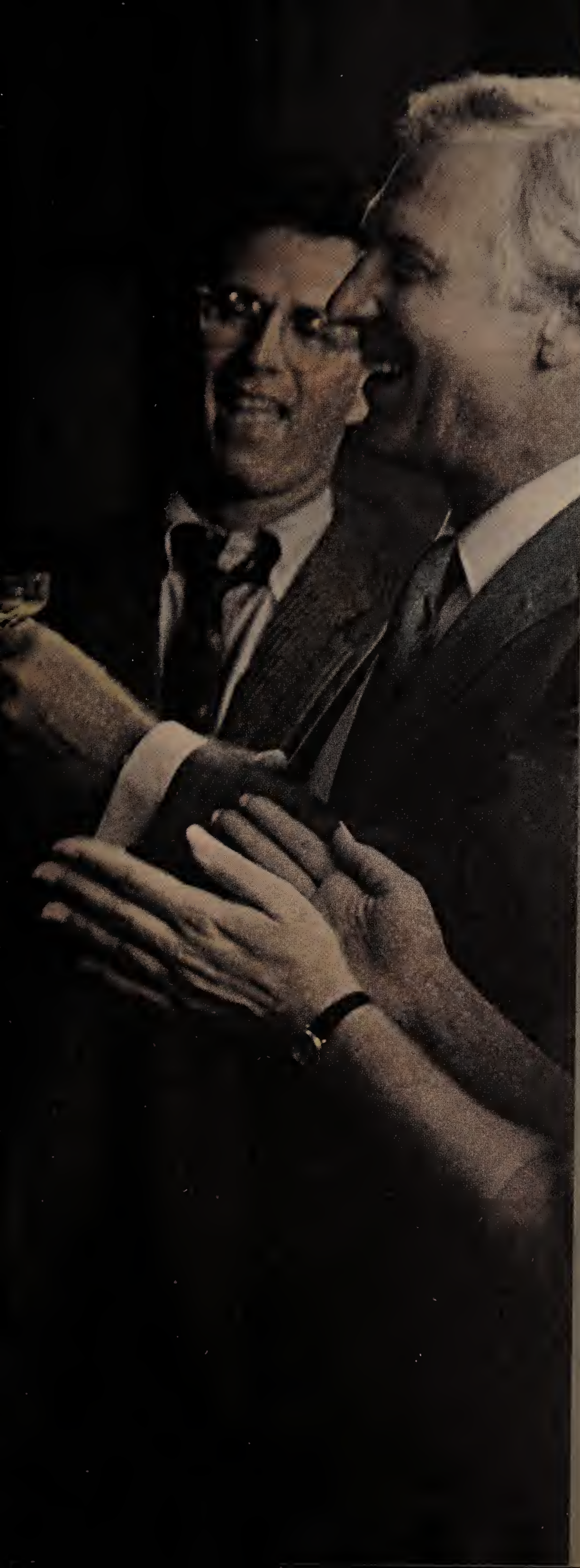
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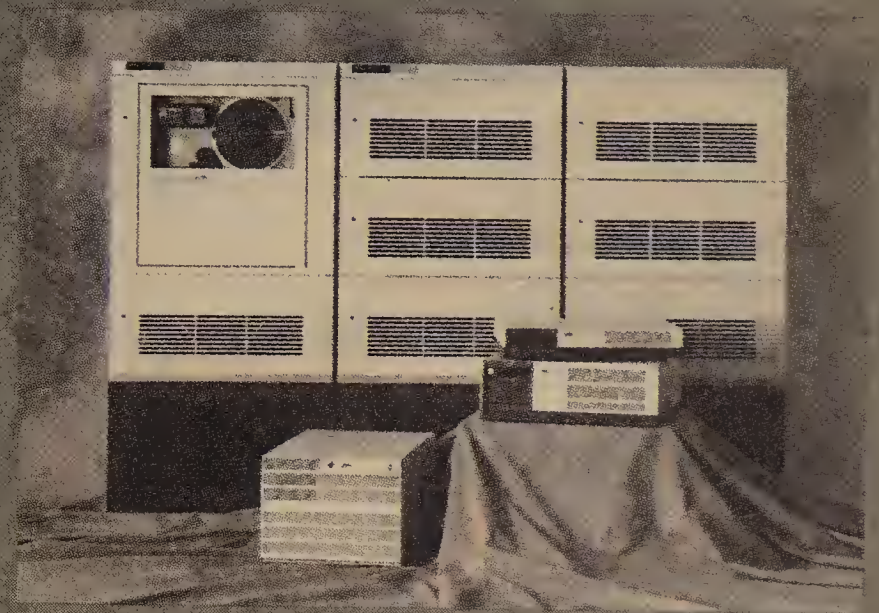




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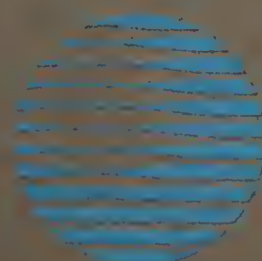
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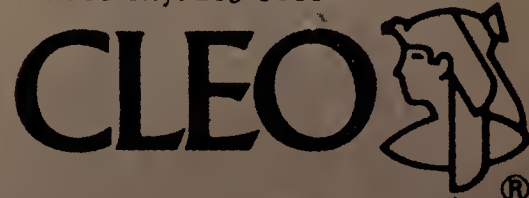
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INDUSTRY UPDATE

With friends like these . . .

Following its unsolicited bid to acquire local network vendor Ungermann-Bass, Inc., Digital Communications Associates, Inc. distributed a press release saying its proposal is a "friendly, nonhostile effort to expand the technological resources of both companies." Ungermann-Bass spokeswoman Angela Mongillo takes issue with that view. "That's what they say — obviously Ralph Ungermann feels differently." The Ungermann-Bass board of directors will meet on Nov. 12 to discuss the proposal.

COMPANY PROFILE

Digilog back in black via net control wares

BY MARY LINEHAN
Staff Writer

MONTGOMERYVILLE, Pa. — Digilog, Inc., founded in 1969 to make terminals, survived a stint as a microcomputer vendor in the 1970s and early 1980s before finding its current niche as a vendor of protocol analyzers and modem-independent network management systems.

Digilog settled into the data communications test and control equipment market after a string of quarterly losses that began in 1983 forced the company to divest its foundering microcomputer division in 1984. The company returned to profitability in 1986, when it reported profits for three of four quarters.

Although test and control equipment accounted for only 55% of the company's \$14.9 million in 1984 sales, it accounted for nearly all of Digilog's \$16.7 million in sales in 1987.

Digilog posted net income of \$930,796 for the first nine months of its 1987 fiscal year, as compared with a net loss of \$85,760 during the same period, ended June 30, last year. Revenue for the nine months was \$12.8 million, up 18% from the same period in 1986. The company has not yet released figures for its fiscal year, which ended Sept. 30.

Ron Moyer, chairman, president and chief executive officer of the company, attributed Di-

gilog's return to profitability to the company's ongoing effort to develop new software for its existing protocol analyzer line, and to successful marketing of network management systems to the Bell operating companies and other common carriers.

Digilog's microprocessor-based protocol analyzers — devices that allow users to observe



Ron Moyer

and analyze transmission problems without disrupting operations — are designed specifically for monitoring and testing single links in data communications networks.

The company's first series of digital test equipment was the Data Line Monitor (DLM) series, of which more than 5,000 units were sold from the early '80s until 1986, when the series was phased out. The DLM series was superseded in 1984 by a family of automatic protocol analyzers: the Digilog 200, 400, 600 and 800. In 1986, the 200 was replaced by the more advanced Digilog 300.

Designed to accept character- and bit-oriented multilevel protocols, the four analyzers offer automatic protocol analysis and interpretation capabilities that explain various problems to the user. According to the company, its software programs support all popular protocols, including IBM's Systems Network Architecture/Synchronous Data Link Control, High-Level Data Link Control/X.25, and X.21, as well as Digital Data Communications Message Protocol. The software also supports newer technologies such as Signaling System 7 and Integrated Services Digital Network Link Access Procedure for D channel.

"We've developed more than 300 application packages for our units that enable them to do a specific function for end users, like emulating different network elements," said Roy Gemberling, vice-president of sales and marketing for the company. Gemberling said the company offers certification packages that verify products are compatible with X.25 and X.75 networks.

While the devotion to new application development helps end users feel confident that their new equipment will not become obsolete over

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GENERAL SERVICES ADMINISTRATION

GSA to divvy up FTS 2000 contract

Two vendors to split work.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The U.S. General Services Administration recently announced plans to award the \$4.5 billion Federal Telecommunications System (FTS) 2000 contract to two prime contractors, rather than one, in an effort to allay mounting congressional criticism over lack of competition in the procurement.

The GSA will divide the FTS 2000 service contract on 60%-40% basis, whereby one vendor will supply 40% of the required network services and the other will provide 60%, said GSA spokesman Robert Fisher.

But, in a surprise move, the GSA said it reserves the right to award the entire contract to one vendor if after reviewing all bids "it deems it in the government's best interest," according to the contract amendment issued by the GSA on Oct. 30.

The contract will be divided on an agency-by-agency basis as much as possible, according to the GSA amendment, to avoid having one agency serviced by two contractors.

The FTS 2000 contract will run for 10 years, and the GSA will reevaluate vendors' performance and rates after four and seven years.

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VENDOR VIEW

PHILLIP NORMINGTON

From plans to production

Many network planners charged with designing private T-1 networks for their companies are concerned about how best to get the design off paper and into production. It is taken for granted that the network planner's technology and design skills — used to come up with the "what" elements of the networking equation — naturally carry over into the "how" of building networks.

Three critical network phases — preparation, implementation and management — have an impact on the successful transition from design to production. Each step is a foundation for the next. Starting with preparation, ask, "Does the design meet your objectives, and are all elements identified?" If the answer is yes, you have a project and should proceed.

Network designs should stand up to scrutiny from different perspectives:

Normington is director of T-1 projects and customer support division at Digital Communications Associates, Inc.

■ **Network geography.** Look at the actual shape of the T-1 backbone network, including spatial and distance information, staffing information and site contacts and numbers.

■ **Network topology.** Examine the sub-networks that will ride on the backbone. Measures of quantity and mix will help you determine nodal size and interface requirements. Also examine each application for its physical, electrical and protocol interfaces.

■ **Circuit map.** Examine the bandwidth requirements for the net in order to gauge the design's accuracy.

■ **T-1 facilities overview.** Examine the T-1 trunks, facility types, providers, local access and transport area boundaries, network interfaces and channel service unit options, and sources of synchronization.

■ **Customer premises equipment system design.** Examine the bay, rack and shelf layout of each site, as well as the connectivity of all elements. Accurate surveys will yield correct cable lengths and presentation information.

See page 12

Digilog back in black via wares

continued from page 11

night, Digilog is also credited with building reliable products.

"General user opinion about Digilog's analyzer products is very good," according to Eric Zimits, an analyst for Morgan Keegan & Co., Inc., a Memphis, Tenn.-based financial services company.

"Most users say the product is highly reliable," Zimits said. "Digilog tends to stress quality control in the manufacturing process, and I think that's proven by the end-user high opinions of its protocol analyzer products as well as its network management systems."

According to Zimits, Digilog offers more functionality at a lower

price than its competitors.

In a recent Datapro Research Corp. user survey, Digilog received its highest marks in product reliability.

The company claims to be second in the protocol analyzer market, trailing Hewlett-Packard Co. and leading Atlantic Research Corp. Zimits said HP is the leader in that market, but there is no clear second or third seed because the market shares held by Atlantic Research and Digilog are so close.

Digilog's second major product line is network management systems. The vendor-independent Network Analysis Management Sys-

tem (NAMS) monitors, alarms, diagnoses and restores communications links between central- and remote-site computers and terminals.

"By producing modem-independent network management systems, our advantage is that we can go into a company that has a mix of modems and provide a system that can wrap around any vendor's modem," Gemberling said. "That way we can provide those users with diversified networks with the same kind of net management capabilities they'd get from a proprietary net management system supplied by a single modem vendor."

BellSouth Corp., Digilog's largest single customer, and Bell Atlantic Corp. both have contracts with Digilog for NAMS. □

From plans to production

continued from page 11

Service demarcation should be seen from this perspective.

Project management is key to success during the implementation phase. Consider a step-by-step method for implementation that includes specific milestone objectives, with measurements and tests to verify completion of each step:

1. Physical installation of each site to verify that the customer premises equipment is operational. Each component should be unit tested and certified. Also, T-1 facilities should be tested and certified before attaching to customer premises equipment.

2. Build and exercise the T-1 network backbone to verify that the backbone is performing to specification. This step should include all failure mode and effect analysis and disaster testing. It should be done before tackling systems integration.

3. Systems integration and testing, with verification using test circuits. Systems integration should be approached on an application basis, with each application having its own criteria for acceptance.

4. Systems acceptance, with verification that the system has performed to specification and is ready for production.

Each step should have predetermined measurements for performance, and each step should be signed off before proceeding. If there are additional tests to perform, develop a standard method of preparing and documenting the tests. Milestone reporting can be done if the project plan has been developed in advance.

Project-controlled implementation should not end when the network has reached systems acceptance. It should end when control of the network has successfully transferred to the Network Control Center (NCC). Only when the NCC has operational control should the project team consider disbanding. A net management plan should be developed for the NCC. Consider the following documentation in addition to vendor-supplied documentation:

1. The guidelines for network service from the design phase;
2. The details of configuration from the implementation phase;
3. Maintenance and support responsibilities, including well-delineated service demarcation and escalation procedures;
4. Methods of corrective maintenance and diagnostics available to the NCC;
5. Methods of preventive maintenance and procedural responsibilities of the NCC.

T-1 technology will require a change in how network control centers approach network management. This change is away from alarm detection and reaction and toward performance evaluation and trend analysis. As network management systems evolve, so will the organizations that manage the networks. □

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TELECOM TRENDS

“If you were to list all the data handling features that each major vendor's private branch exchange has, Intecom, [Inc.] would have the longest list. They cover more bases and support more different types of data communications than the competition. But the question you have to ask is, ‘Do users really need all those data communications capabilities with the switch?’ There are no easy answers.

Ian Angus

President

Angus TeleManagement Group, Inc.
Toronto

TELECOM TIDBITS

Rockwell International Corp. has received orders for seven of its Integrated Switching System (ISS) digital automatic call distributors (ACD) for central office applications at Southern Bell Telephone and Telegraph Co.

ISS, an ACD designed for telephone company use, will replace universal call distributor equipment, according to Clarence G. Marshall, general manager of Rockwell's Carrier Communications Systems.

The new systems will serve 4,500 representatives in Southern Bell's customer service unit, according to Rockwell.

The ISS systems will be installed at three Southern Bell central offices in Florida, two in Georgia as well as one each in North Carolina and South Carolina. The ACD systems are scheduled to be in service by the third quarter of 1988.

In a paper presented to the international community at Telecom '87 in Geneva, AT&T introduced a new fiber network for metropolitan and suburban areas.

Marcy Garriott of AT&T Bell Laboratories and coauthors Eric Angell of Bell Laboratories and Gayton Yancy of AT&T Network Systems described the unique qualities of the network, See **Telecom Tidbits** page 15

► USERS GROUP MEETING

NRUG extends welcome to regional Rolm users

Bylaw amendment gives groups affiliate membership.

BY BOB WALLACE

Senior Editor

SANTA CLARA, Calif. — The National Rolm Users Group (NRUG), at its recent conference here, approved a bylaw change that will enable several regional Rolm Corp. users groups, representing more than 1,000 companies, to become affiliate members of NRUG.

In addition, attendees said IBM and Rolm officials announced during the meeting that users will have the option of obtaining equipment and service directly from IBM/Rolm. Currently, users in most parts of the country deal with independent Rolm distributors for sales and support. As part of IBM/Rolm's Named Accounts Program (NAP), all Rolm customers will have the option of dealing directly with IBM/Rolm as of July 1, 1988.

One Rolm user told *Network World* that as many as half of the users served by these inde-

Key developments at the National Rolm Users Group conference

1. The group changes a bylaw to allow regional Rolm Corp. users groups to join the national body.
2. Rolm expands on its Named Accounts Program, which allows select users to buy equipment and support services from authorized Rolm distributors or from IBM.
3. Rolm issues a statement of direction on support of used equipment such as Rolm private branch exchanges.

SOURCE: NATIONAL ROLM USERS GROUP

pendent distributors may switch to IBM/Rolm.

Rolm also gave users a statement of direction on the issue of support for used equipment, but stressed that comments made at the meeting See page 15

CROSS TALK

BOB WALLACE

Bank turns a profit, minimizes phone abuse

Lise Stanford, telecommunications manager for First Tennessee Bank National Association in Memphis, has helped develop a plan that will curb unauthorized use of the bank's telephone system and generate revenue through reselling spare network capacity.

Stanford has taken one step beyond simply identifying telephone system abuse. Instead of lecturing employees about calling family and friends, Stanford has persuaded them to obtain a second authorization code for nonbusiness calls.

End users can still make toll calls to friends, but they are now charged for the calls. Personal calls are tallied using the bank's billing system. That same system is used to safeguard against phone abuse.

Stanford breaks down authorized calling costs by department and provides that data to department managers. The managers are charged with the responsibility of making sure calls pertain to bank business and are not to employee coun-

ins living in other states.

“Unauthorized use of our telephone systems had reached 10% [of all calls],” Stanford said. To help control those costs without encroaching on personal freedom, “we decided to resell excess network capacity to employees as a company benefit.”

Besides helping to control costs, this option helped the bank defray the cost of underutilized network services.

The bank had recently configured its WATS and other calling services to accommodate peak traffic loads, meaning that during off-peak periods there was excess capacity.

“If we didn't resell the excess capacity, our WATS and other calling services would not be fully utilized,” Stanford said. “We had already configured our network to handle peak communications traffic loads. But we realized there would always be excess network capacity during the day as well as at night and on weekends.” □

► AUTOMATIC CALL DISTRIBUTOR

Hotel reservation net cuts over Galaxy ACD

System software outshined competitors.

BY BOB WALLACE

Senior Editor

MISSION, Kan. — Trusthouse Forte Hotels' North American reservation center located here recently cut over a Rockwell International Corp. Galaxy automatic call distributor (ACD) system, replacing an AT&T Dimension private branch exchange equipped with a Universal Call Distributor.

The Rockwell Galaxy GVS-050B ACD System was chosen over ACDs from five other switch vendors because of its system management software, said Karen Nielsen, director of reservations at the center, which receives 7,000 calls a day. The management package, developed by TCS Management of Nashville, is sold by Rockwell with its ACDs.

“The Dimension and its management information system software did not operate in real time,” Nielsen explained. “All it had was a light that showed when calls were waiting. I had no idea how many calls were waiting to be answered or how long the callers had been waiting to reach an agent,” she said.

The ACD and its software will enable Nielsen to use a terminal to determine how many calls have not been answered.

“The screen is continually updated,” Nielsen added. The 386-port ACD initially supports 100 agents. Incoming calls are supported using AT&T's Megacom 800 toll-free service.

Nielsen said the Rockwell ACD and associated software will enable her to forecast growth of the reservation operations and allocate staff accordingly. “Data from the Galaxy will allow me to determine the efficiency of each agent, see how long it takes for each call to be answered and measure the length of each call.”

Nielsen said she visited a Galaxy ACD user — The Sheraton Corp.'s Austin, Texas, facility — to discuss the performance of the ACD before the contract was awarded to Rockwell.

According to Nielsen, her company purchased a PBX package for the ACD that will allow the device to switch both outgoing calls and calls between employees while simultaneously performing its ACD functions. □

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NRUG welcomes regional users

continued from page 13

didn't represent a formal policy. Rolm said, "Both IBM and Rolm will support Rolm gear purchased from other parties." Rolm officials would not comment on whether support would extend to a user purchasing a private branch exchange from another user.

According to NRUG officials, IBM/Rolm also said it would continue to support current Rolm equipment for 10 years after manufacturing is discontinued.

The NRUG bylaw change came at the request of regional Rolm users groups seeking a means of voicing their needs and concerns to top Rolm management. Jay Silverberg, a senior NRUG officer, said these users' highest point of contact for problem resolution has been Rolm's regional, not corporate, management.

Under the new program, regional users groups can become affiliate members of NRUG, and each regional group will be allowed to appoint one person to serve as a voting member of NRUG. Resolutions from the regional groups will be forwarded to Rolm along with NRUG's resolutions.

NRUG officers met with key members of the regional groups during the NRUG conference. "We were overwhelmed by the enthusiasm the regional groups' leaders had for the program." The Metropolitan Rolm Users Association (MRUA) will become an NRUG affiliate, added Silverberg, who is MRUA president and communications manager for Eastern States Bank Card Association in Lake Success, N.Y.

MRUA currently represents 110 user companies. Silverberg said members of the regional groups have often been unable to resolve problems by dealing with Rolm's regional management.

"These regional groups came to us with laundry lists of items they said needed to be addressed," he explained. NRUG's board "decided their problems would be best sent through regional channels as they often dealt with regional service

and support issues. But we told them if they were not satisfied there, they could pass the problems to us for escalation on a national level," Silverberg explained.

Another NRUG senior officer, Donna Turcany, said NRUG had identified more than 15 regional Rolm users groups and added there are probably several more. Affiliation with NRUG, Turcany explained, will not affect the regional groups' autonomy.

"Members of regional users groups will continue to communicate and deal with regional Rolm management," she said.

Turcany, who is telecommunica-

tions director for the American Medical Association in Chicago, explained how the regional groups will work with NRUG. "If regional users group members, for example, need a new maintenance service option or are looking for a product enhancement, they can bring their requests to us," she said. "At present, they cannot make these things happen on their own."

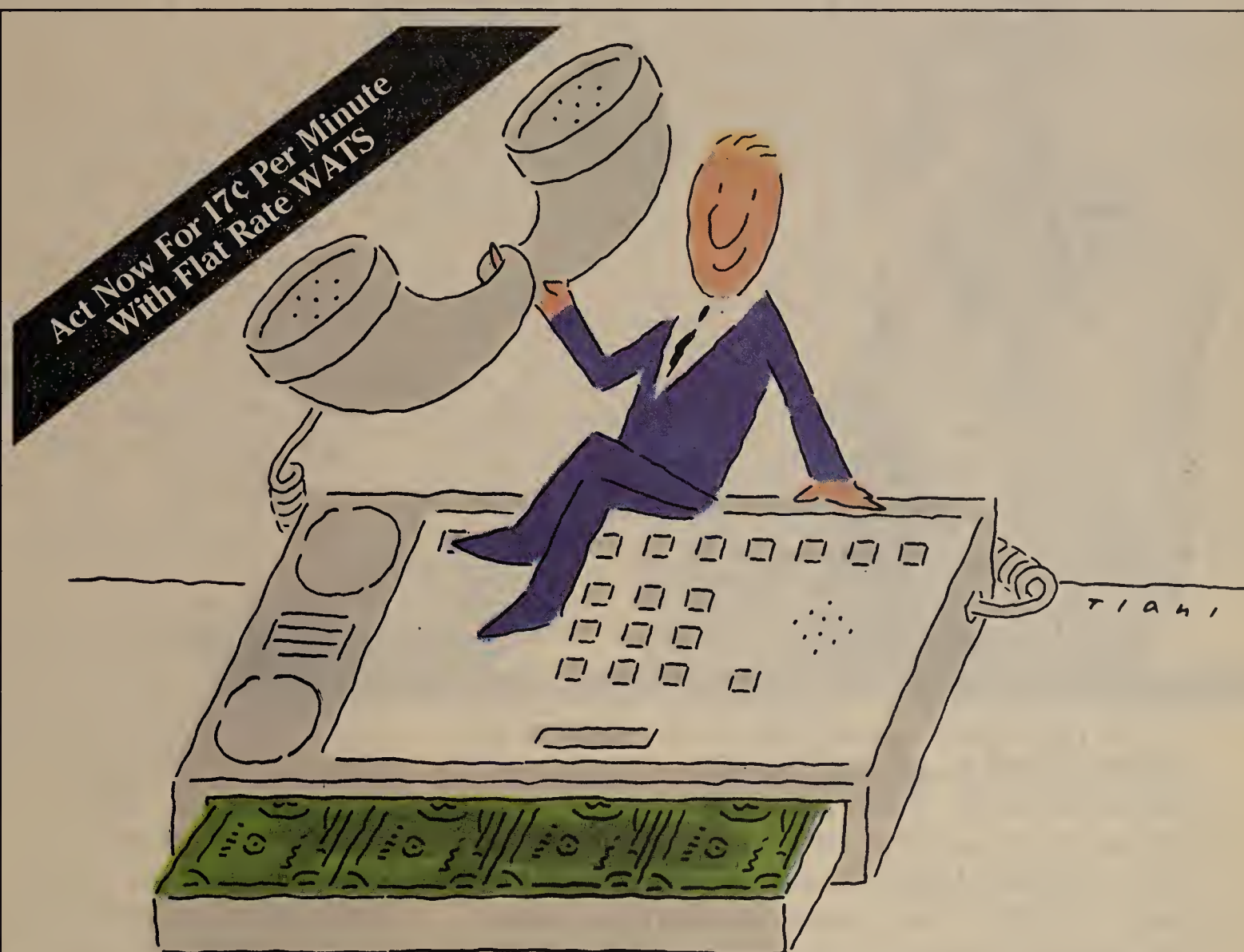
Jack White, director of field operations for Rolm, announced the NAP during the meeting. Under NAP, some large Rolm users can now select IBM as their equipment distributor. Beginning July 1, all other Rolm users will be offered the same option.

Rolm currently allows 10 regional distributors to sell its equip-

ment, via exclusive agreements, in specific geographic regions as part of its Independent Distributor Division program. A user's geographic location determines whether the user deals directly with Rolm or with a distributor.

Pat Springer, an NRUG senior officer and telecommunications director for Holly Farms Poultry Industries, Inc., in Wilkesboro, N.C., predicted large Rolm users would opt to deal with IBM for equipment and support services because NAP offers them a single point of contact.

"Dealing with one supplier for all your locations would also mean your equipment and service prices could be standardized nationwide," Springer said. **■**



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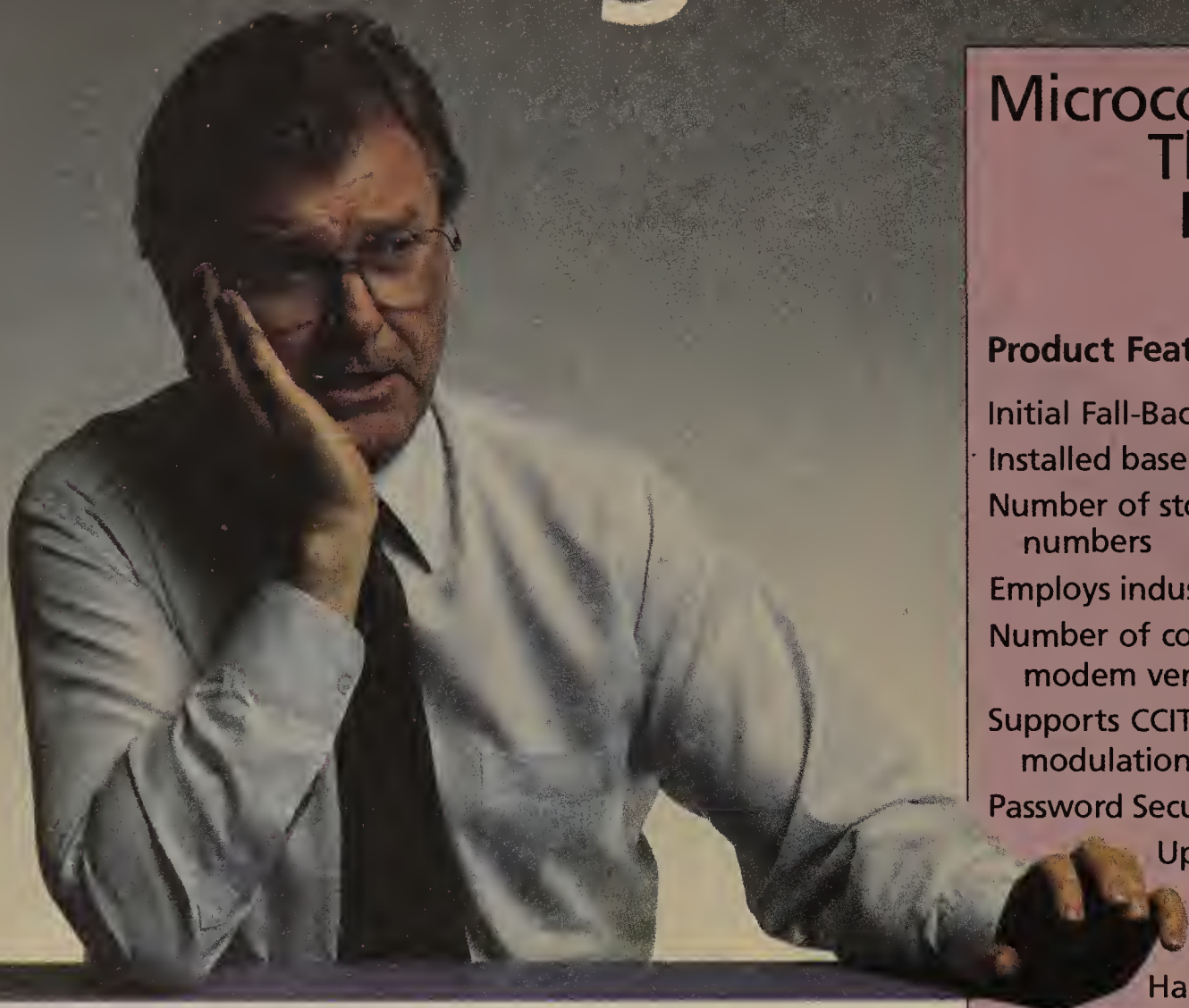
Telecom Tidbits from page 13

dubbed Metrobus. According to the authors, Metrobus is the first commercially available, internally synchronous fiber network for interoffice transmission that accepts synchronous and asynchronous traffic. The net also easily rearranges signals at each point in the network, increases the number of ways for users to interface with the net and reduces the overall cost per bit to send traffic over the network.

Garriott said Metrobus accepts up to 84 low-speed signals and synchronizes and combines them into a synchronous signal at 146M bit/sec. The net can be configured as a point-to-point system or with crossover points.

The first installation of Metrobus was recently completed in an Illinois Bell office in the Chicago area. **■**

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► METROPOLITAN AREA NETWORKS

Harris wires up campus with fiber, local nets

Metronet links 17 buildings via fiber backbone.

BY MARY LINEHAN
Staff Writer

PALM BAY, Fla. — Harris Corp. is installing a campuswide network here that includes a fiber-optic backbone linking local networks scattered throughout the facility and wiring systems in each of 17 buildings to provide data outlets in every office.

Harris Government Systems Sector's (GSS) Metronet, short for Melbourne Metropolitan Area Network, is intended to reduce the cost of rewiring computer systems to accommodate the company's project-oriented business and enable project members in different buildings to communicate.

According to John Barnes, project director and engineering manager for communications at GSS, implementation of Metronet involves two major activities: the connection of the GSS

buildings via the fiber-optic backbone and the wiring/rewiring of buildings to provide each with a unified wiring system that provides data outlets in all offices.

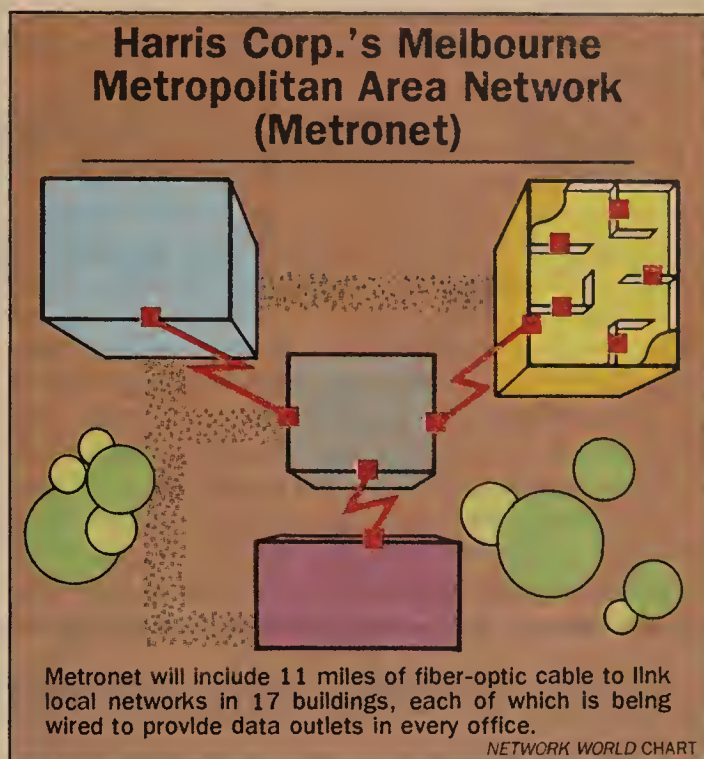
Approximately 11 miles of fiber-optic cable, what Barnes calls the "network superhighway," has been installed to support Metronet. The buildings are being wired with twisted pair and thin coaxial cable to support the local nets, or what he calls the "local traffic arteries."

According to Barnes, the coaxial cable is being run only to offices with an immediate need for 10M bit/sec Ethernet. GSS is in the process of installing hardware that will allow Ethernet to run on twisted-pair wire.

"Each building's local network can connect to the backbone via a bridge," Barnes said. "The bridge keeps local traffic isolated to a building or cluster of buildings and off the superhighway. Backbone traffic does not enter a

Visa goes to China

Visa International, Inc. recently expanded its point-of-sale authorization network to China. Hardware used to authorize credit card transactions was installed to link Bank of China offices in Beijing to Visa's authorization center in San Francisco. Each transaction takes about 20 seconds, with 15 seconds needed to transmit the information through the Chinese phone system.



building's local traffic unless it is addressed to a node there," Barnes said.

Barnes' plan would link users — mostly engineers — to the 11 Harris superminicomputers on the campus, linking existing local-area networks and simplifying moves and changes. Users could unplug terminals, carry them to new

See page 18

DATA DIALOGUE

STEVEN A. MARTINEZ

E-mail needs spur bridging of OSI, SNA

Speculation concerning multivendor network connections will soon focus on two distinct architectures: IBM's Systems Network Architecture and the International Standards Organization's Open Systems Interconnect (OSI) model.

The desire to interconnect these architectures will be driven, in part, by the need to connect various electronic mail services.

At the end of 1989, SNA will be thriving. IBM has inundated the industry with architectures and products, such as Advanced Program-to-Program Communications, Document Interchange Architecture (DIA), Advanced Peer-to-Peer Networking, Distributed Data Management and Systems Application Architecture.

Competitors such as Digital Equipment Corp., Wang Laboratories, Inc., Data General Corp.

Martinez is vice-president of sales and marketing at Communications Solutions, Inc., a San Jose, Calif., software and consulting firm.

and Hewlett-Packard Co. are busily supporting or announcing support for the OSI model. They have not, however, been able to reach agreement about which subset of these protocols should be implemented. So, for the most part, their communications networks remain incompatible.

End users continued to demand products that support multivendor networks. Document distribution, specifically E-mail, is a key requirement as users try to link different systems. For distributing documents, three solutions will be available.

First, IBM's DIA and SNA Distribution Services (SNADS) are complementary architectures and, by virtue of installed base, will constitute a de facto industry standard. The two architectures are embodied in current IBM E-mail products such as DISOSS.

The second solution is the X.400 Message Handling System proposed by the Consultative Committee on International

See page 18

► DELIVERY OPTIONS

Racal-Milgo distributed matrix switch debuts

BY PAUL KORZENIOWSKI
Senior Editor

SUNRISE, Fla. — Racal-Milgo, Inc. recently unveiled a distributed matrix switch that can be managed by the company's Communications Management Series (CMS) network management system.

The CMS Matrix Switch, manufactured by Bytex Corp. of Southborough, Mass., supports up to 4,096 ports and features a non-blocking design. It supports RS-232 and four-wire analog line interfaces at speeds ranging up to 19.2K bit/sec, and it supports V.35 at speeds up to 76.8K bit/sec.

The deal fills in a hole in Racal-Milgo's broad product line and is further evidence of an industry trend to round out product lines by forging strategic alliances and OEM agreements, according to Katherine Korostoff, an analyst with International Data Corp., a Framingham, Mass.-based market research firm.

Racal-Milgo is trying to integrate a full line of communications equipment under the control of its CMS network management system. Prior to the announcement, distinct network management systems were needed to control equipment such as matrix switches,

which are used to route traffic between two or more front-end processors. If a front end fails, the matrix switches can automatically switch lines to a spare unit, ensuring network availability.

Up to 16 satellite switch modules, each supporting up to 256 ports, can be connected with coaxial cable to a central matrix switch located up to 300 feet away. Without remote switching, devices have to be within 100 feet of a CMS Matrix Switch.

Distributed matrix switches supply users with two benefits, Korostoff said. Many data centers are crowded, making it hard to house a large matrix switch, and distributed switches reduce cabling costs by providing local ports. Ten terminals in a department can be connected to a central switch by one 300-foot cable rather than through 10 separate lines.

The CMS Matrix Switch features a dual processor design and 40M bytes of hard disk storage. Users can control the switch through an asynchronous terminal.

Korostoff said Bytex captured 36% of total revenues of the domestic matrix switch market in 1986, making it the market leader.

The Racal-Milgo product costs approximately \$400 per port. □

Harris wires up campus

continued from page 17

offices, plug them into a wall jack and be on the network. "It's push-pull, click-click, change locations real quick," Barnes said.

"Users can change their physical location, but their logical address on the network stays the same," he continued.

"We have a tendency here to move people around quite a bit in order to collocate them to support projects better. Moves and changes of personnel are the theme of the day."

Research on Metronet began about three years ago, Barnes said, and implementation has been ongoing for the last nine months. Currently, about half of the buildings have been rewired to support Metronet

and all major buildings on the campus are expected to be rewired by the end of June 1988.

Barnes estimated the project will be complete in 15 to 18 months and, by that time, the network could serve up to 7,000 users.

"Total investment in the project will be close to two or 2½ million [dollars] by its completion," Barnes said. "We expect the payback within three to five years, and the clock is already running on payback in buildings that are already wired. We would hope to reduce the cost of moves and changes, on a campus this size, by a half million [dollars] a year."

Barnes said the building

wiring scheme developed for Metronet can support Ethernet, Apple Computer, Inc.'s AppleTalk and IBM Token-Ring local networks, as well as RS-232/422, Systems Network Architecture/Synchronous Data Link Control and Binary Synchronous Communications connections.

"There are only a few proprietary networking implementation schemes that we have found cannot be supported by the Metronet architecture," Barnes said. Gateways act as translators for the different protocols enabling users within one network environment to cross over into other domains, he added.

The backbone supports Transmission Control Protocol/Internet Protocol, Xerox Corp.'s Xerox Network Systems, DECnet and Har-

ris' Lat-11. Barnes said gateways between environments would be added as user needs dictate. He noted that TCP/IP and DECnet are the predominant protocols.

Barnes said he hasn't yet seen a user device — a workstation or terminal — that cannot be supported by the wiring in place.

"We can interface several classes of equipment to Metronet," he said.

IBM 3270s, Daisy Systems Corp. and Sun Microsystems, Inc. workstations, computer-aided design systems from Computervision Corp. and Calma Co. and the Harris superminicomputers — such as the H800, H100, H1200, HZX7 and HZX9 — are all linked to Metronet.

"We will have equipment on the network that

ranges from the cheapest asynchronous terminal, costing maybe \$300, to expensive design workstations that can cost \$10,000 to \$15,000," Barnes said.

According to Barnes, users once confined to communicating via "sneaker-net" are pleased with Metronet's capabilities. "They used to have to carry a floppy disk a half a mile to get it to somebody, but now, if it takes 15 seconds to send information electronically, they're complaining. Once you have something like this, you can't live without it," he said.

Word processing is a major application of the network, as is the sharing of data base information in the engineering community and budget tracking in the financial services area. □

E-mail needs spur bridging

continued from page 17

Telephony and Telegraphy and included in the OSI model. Because a variety of companies will support it, X.400 will become an international standard.

The third type of solution will be proprietary approaches, such as DEC's All-In-1. These products will continue to enjoy varying degrees of acceptance. Their overall success, however, will be heavily dependent on their ability to coexist with the IBM and OSI architectures.

If our vision of networks in 1989 is correct, then a logical starting point for linking networks would be

to build a gateway between IBM's DIA/SNADS and X.400. To do that, we need to decide what information should be sent across that gateway.

First, let's take a look at what constitutes a document. Early E-mail systems, such as those available from the public network vendors, could only handle text documents. Currently, users are requiring increasingly greater flexibility.

It is not uncommon for a user to want to distribute text messages, spreadsheet formulas and data, and even binary-executable programs.

DIA/SNADS and X.400 are powerful architectures. Both support E-mail and document distribution by ignoring the contents of the document being distributed.

They supply an envelope for the document as it enters the system. This envelope contains sufficient information to allow routing and delivery.

The problems in transferring messages between IBM and CCITT architectures are similar to the ones encountered by the U.S. Postal Service when delivering mail to foreign countries — the addressing schemes are not the same. In addition, there are compatibility problems in the way the mail systems function, the types of services they offer and the contents of a message. These differences, however, are more in the area of features and not in basic architectural design.

The real stumbling block

to interconnection is addressing, or naming conventions. Naming conventions are utilized by the distribution services within both architectures to identify the source, destination and routing.

SNA's addressing scheme utilizes two names, separated by a period (for example: MARTINEX.SAN JOSE). IBM calls them Distribution User Names and limits them to a maximum of eight characters each.

In X.400 addressing,

network and then defines a data base, parts of which can be distributed throughout the DIA/SNADS net.

While this capability is limited and does not allow automatic updating, it is much better than the current X.400 architecture, which contains no directory services. Standards bodies are aware of this limitation and are scheduled to release X.500 standards defining the directory services utilized by X.400.

The two architectures

The problems in transferring messages between IBM and CCITT are similar to the ones encountered by the U.S. Postal Service when delivering mail to foreign countries — the addressing schemes are not the same.

both originators and receivers of documents are identified by names. For example, one version of the standard requires that both originator and receiver be identified by country, administration domain and at least one additional name, such as personal or organization name.

X.400 specifies several options for the additional names used. Following our example above, USA.TELENET.MARTINEZ would be a valid name. The addressing scheme within the X.400 architecture is significantly more flexible, but the flexibility means an increase in the complexity of both maintenance and processing.

The addressing scheme within SNA architecture is less flexible, but it does a better job of separating the user name and routing function. SNA requires that part of the user name be unique across the entire

have enough in common to allow the exchange of documents. However, some loss of functionality will occur. Because X.400 addressing is more flexible, X.400 users should be able to reach into the IBM world via DIA/SNADS. But due to the limitations of the SNA naming conventions, the reverse direction will be much more difficult.

In the short term, clever transformation programs should be able to handle many of the differences. But in the future, users will find improved levels of connectivity.

A better answer, but one that will take time, is to make adjustments to the architectures themselves. For example, enhancements could be made to DIA and SNADS to provide a more flexible addressing scheme. When it is introduced, X.500 could contain directory services compatible with those in SNADS.

When comparing functions that have the greatest appeal to automated users, the IBM approach offers library services, application processing and distributed processing, features lacking in X.400. On the other hand, X.400 is richer in traditional E-mail functionality, including features such as "blind carbon copy," and "in reply to" which are not available in DIA or SNADS.

How should users try to solve incompatibility problems? The ideal scenario would be for each vendor's equipment to be able to communicate with everyone else's equipment. Vendors would then assume the responsibility for linking the various systems. Such an approach is unlikely because vendors have to differentiate their products in order to sell them.

A second path is available to managers with large support organizations and healthy budgets. They can select one of the existing architectures and begin developing their own solutions. This approach would require a lot of work to keep pace with the chosen standard.

The most realistic approach is continued support of proprietary architectures and the development of bridges between them. IBM, for one, has taken some initial steps in this direction with the recent announcement in Europe of a DISOSS-to-X.400 bridge product.

However, this product is an initial step and not a panacea. The IBM product and other vendors' wares will continue to evolve as users try to develop multi-vendor networks. □



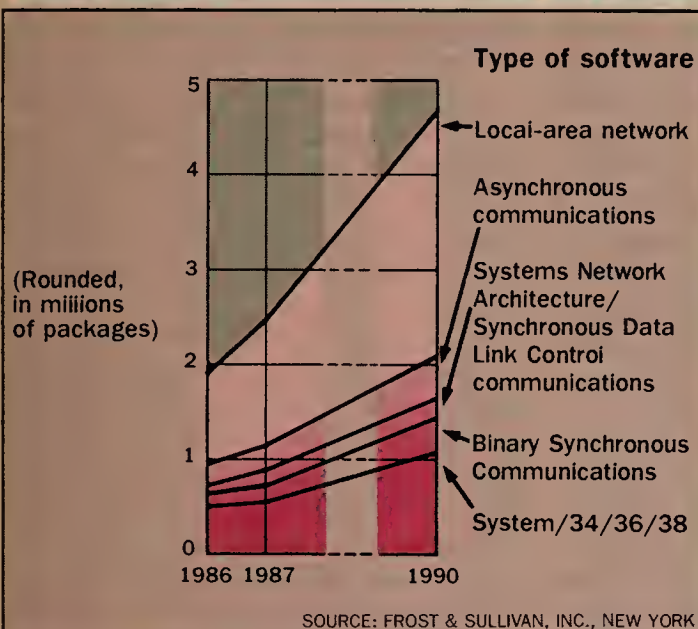
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LOCAL NETWORKING

Market forecast: shipments of personal computer communications software



ETHERNET-TO-ETHERNET

Netways offers secure bridges

BY PAULA MUSICH
Senior Editor

MELVILLE, N.Y. — Internetworking vendor Netways, Inc. recently announced a line of bridging products that offer optional data encryption and other security features for IEEE 802.3 Ethernet-type local networks.

The Bridge+ bridges interconnect any combination of Ethernet, Thin Ethernet and Starlan local nets locally using fiber-optic links and over wide-area links such as X.25-based packet-switched network services.

Available with the bridge line are two optional encryption schemes: a proprietary encryption algorithm and an algorithm based on the National Bureau of Standards' Data Encryption Standard.

The encryption options allow network administrators to protect sensitive data from interception or modification as it is moved between bridges over less secure public data nets.

The Bridge+ line also includes security address filtering, which allows network administrators to lock out certain network nodes from accessing other subnets through the bridge. Filtering is provided for source-based security and destination-based security.

Using source-based filtering, a network administrator can configure a bridge to block access to the network for specific network node addresses. Destination-based filtering can block all nodes from one subsegment from accessing specific nodes on another subsegment.

In addition to X.25 wide-area links, the bridge products also support remote T-1 links, private lines and microwave links.

The Bridge+ line, which supports a filtering rate of 10,000 frame/sec and a forwarding rate of 5,000 frame/sec, is priced from \$5,695 to \$8,000. The products will be available in January, and support for T-1 links will be available in the first quarter of 1988. □

LAN BLUEPRINTS

Local networks key to realtor's strategic edge

BY PAULA MUSICH
Senior Editor

NEW YORK — In looking for a way to consolidate the computer operations of several merged real estate companies, nationwide real estate services firm Grubb and Ellis Co. adopted a strategy that may give the firm an edge over competitors.

Grubb and Ellis' strategy is to install personal computer local networks running property management software and other applications. The diversified real estate services firm is hoping to offer clients the same type and quality of service at each of its 163 offices nationwide.

The company has already installed one local net in its Northeast region headquarters here. Another installation is planned for the New England office.

Grubb and Ellis, which originated on the West Coast, began buying top real estate firms in target markets around the country during

the 1980s in a move to become a nationwide provider of commercial and residential brokerage services. The company also offers real estate investment banking, appraisal and consulting as well as property management and other services. The Northeast offices include the merged James Felt Realty Services, Inc. and William A. White/Tishman East, Inc. companies.

The firm considered using minicomputer-based systems but discovered that a personal computer network would allow it to run the same graphics and data base programs cost-effectively in even the smallest of offices.

"The network gives us the ability to run one common set of software throughout the organization," said Jeff Cantor, who is responsible for the firm's Northeast computer operations. "If a client goes across the country and sees the same presentations and capabilities in all our offices, whether in Denver or New York, it will show

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LANMARKS

PAULA MUSICH

A show for PC networking alone

Does the personal computer networking industry need its own trade show? Currently, there aren't any shows geared specifically to networking microcomputers. Instead, there are many different shows to which personal computer networking vendors go to show their wares, along with vendors of all different types of communications and computing products.

At these general shows, there is usually at least a token seminar on local networking issues, if not a whole series of seminars. Some of these seminars are useful, but others are merely used by vendors to hype their products.

Among the shows that partially serve the microcomputer networking industry is Localnet. For a show that has been around for a while and is supposed to play to the hottest segment of the communications industry, Localnet is comparatively small.

One of the factors limiting its size is its apparent focus. According to industry observers, the conference is a terminal-to-host or general-purpose local network show. Although Ungermann-Bass, Inc., Bridge Communications, Inc. and Sytek, Inc. have been well represented at Localnet, Novell, Inc. and other personal computer networking vendors have not.

Then there is PC Expo. This trade show was originally chartered to serve the information needs of volume personal computer buyers. Over the past few years, however, it has expanded its coverage beyond hard disk products and application software to

include personal computer networking products. It has embraced microcomputer networking to such an extent that industry pundits wonder out loud whether it is now the personal computer network show.

There is also Novell's unique NetWorld, a curious cross between a vendor-specific exhibition, similar to Digital Equipment Corp.'s DECworld, and an industry trade show. Because so many products support Novell's NetWare network operating system, NetWorld had the illusion of being an industry trade show. Also contributing to the illusion was the presence of competitor Banyan Systems, Inc. at this year's show. Because of Novell's phenomenal success, the show managed to draw quite a crowd.

Most of the attendees at NetWorld were not concerned about the specific slant toward Novell. They were already committed to NetWare and were merely in search of products that allowed them to enhance their existing networks. A few, however, came in search of products that would allow their Novell file servers to communicate with other vendors' servers. One attendee hoped to find a 3Com Corp. 3+ version of an application that currently runs on NetWare. Such attendees left disappointed.

Although these various trade shows serve the needs of the industry in their own unique way, none seems to serve the information needs of potential and current microcomputer network end users adequately. □

Local nets key to strategic edge

continued from page 19

them we're all working together as a group. Our competitors can't do that.

"We're trying to develop a master plan to be able to get more information into our clients' hands in ways they'll understand it," he explained. "Rather than hitting someone's desk with a book full of computer printouts, we want to show them where their property stands or when the lease of a particular building is up. That should set us apart from the rest of the industry."

Cantor said he is encouraged by the firm's success with the first network. He added that executives at other offices have followed the project and feel they could benefit from use of personal computer networks as well. "Others started looking at what we were doing there, and they thought their PCs should be tied together too," Cantor said.

At the Northeast region headquarters, an Arcnet-based network links 60 personal computers and two ITT Corp. ATW 286 servers — which are IBM Personal Computer AT-compatible — running Novell's NetWare 286 network software. Workstations are linked via Tiara Computer Systems, Inc. Arcnet cards. The net was installed during the summer to consolidate comput-

ing and office automation capabilities, as well as to upgrade an aging property management system. The network was installed with the help of local net reseller Access Data Products, Inc.

Prior to installation of the network, one of the companies bought out by Grubb and Ellis leased the property management accounting system along with the Datapoint Corp. minicomputers on which the system ran. The Datapoint minicomputers, linked in an Arcnet network, also ran word processing software, although most word processing was being done on stand-alone personal computers. "There was nothing cohesive about the equipment we had," Cantor said.

Although Grubb and Ellis considered expanding its use of Datapoint equipment, Cantor said it was too expensive, costing the firm more than \$100,000 a year in leasing and maintenance.

Expanding its use of stand-alone personal computers was also unacceptable. "What we had was a bunch of secretaries doing the same things on parallel, stand-alone PCs," Cantor explained. "They had a big central shoe box full of diskettes and had to share the same information. There were things like commission letter blanks and lots of boilerplates that

needed to change hands. Once in a while, someone would throw a diskette under a desk, and it would never be seen again."

A personal computer network seemed to make the most sense because it would allow Grubb and Ellis to use some of its existing equipment, and it would let the secretaries share information in a more manageable way.

"The idea of running one computer system, instead of a few smaller ones or instead of a computer system and stand-alone word processing units, seemed sound," Cantor said. "We liked the idea of putting the same machine on different desks to do different things, and the incremental cost of adding workstations was favorable."

In researching the price/performance differences between a minicomputer and the personal computer network, Cantor found the network could pay for itself in two years. The initial installation, which included 50 workstations along with the servers and printers, cost Grubb and Ellis \$150,000.

"When we saw the net could handle the work being done on the mini and stand-alone word processing systems and pay for itself within two years," Cantor said, "the decision became elementary."

Applications on the network, besides the property management software, include the network version of Word Perfect used by all

employees. Cantor said many professionals prefer to put their notes together on the system for brokerage proposals and correspondence and then send the notes along to the secretaries to be cleaned up for presentation.

The network also supports Lotus Development Corp.'s 1-2-3, "as networked as you can and still stay within the law," Cantor said. Grubb and Ellis also recently installed Ansa Software's Paradox data base management system, which provides a query graphic interface that allows brokers to turn out their own reports on the market easily.

"The system has worked its way into all the different corners of the business, handling presentations, proposals and day-to-day correspondence needs," Cantor said.

Cantor is working with a counterpart on the West Coast who is responsible for networks in some of the Los Angeles offices. "The New York project is actually serving as a blueprint for what we hope to do across the country," he said.

"Once we've proven the technology on both ends of the earth, we'll start sweeping it toward the middle, and I hope we'll meet somewhere around the Mississippi River," Cantor said.

"It will snowball wherever offices are using PCs: They are the common bond." □

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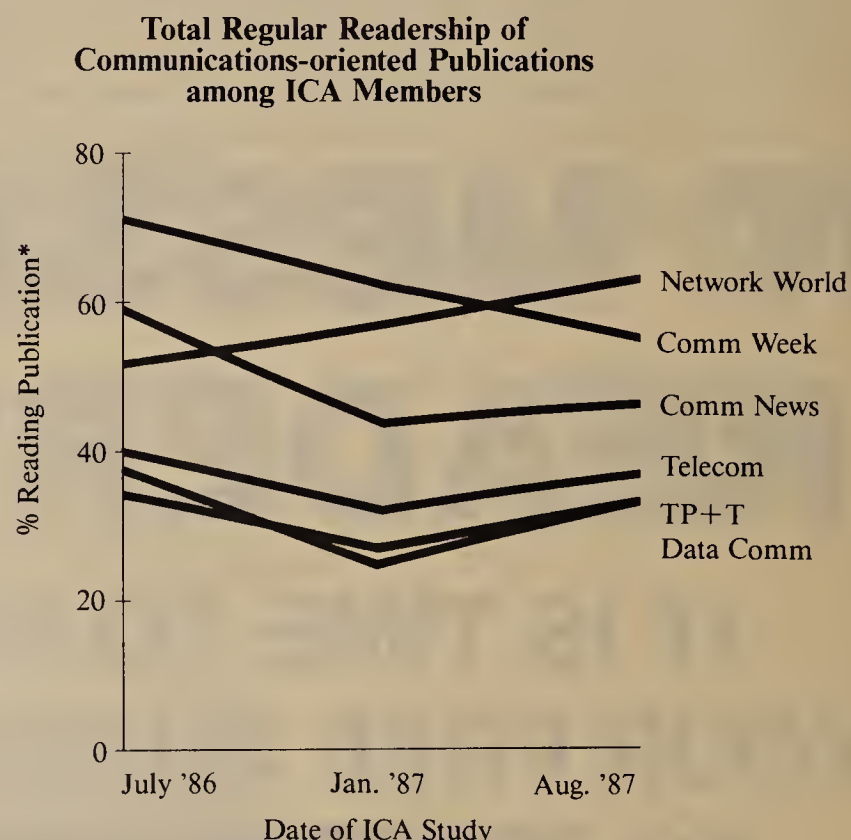
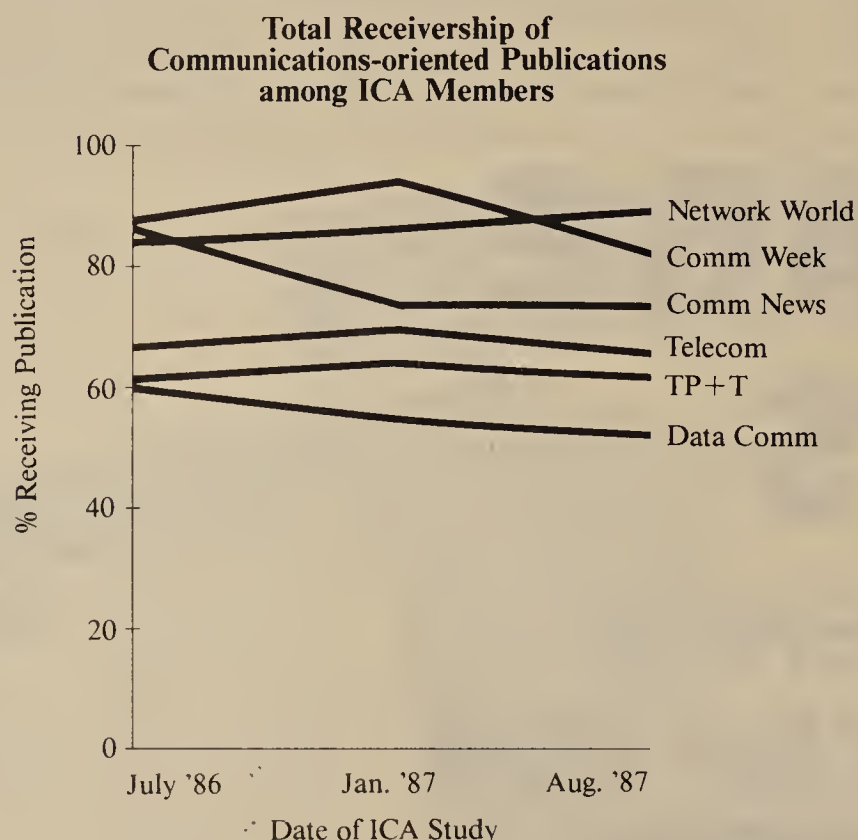
Gary J. Beach
Publisher

"Rome wasn't built in a day." Although you've heard this saying time and time again, the philosophy behind it — that through hard work you can make things better day by day, week by week, and year by year — remains sound.

It's this very philosophy that *Network World* editors have followed during the past 18 months. And in doing so, they have remained true to their initial goal: to make each issue of *Network World* the best possible for you, our readers.

Evidence is growing that *Network World's* long-term commitment to editorial excellence is paying off. In fact, the latest study conducted by an independent research firm among ICA members shows rather impressive results. Not only does *Network World* top the list of communications-oriented publications in receivership, but it now ranks number one in readership as well.

As you can see in the following charts, both receivership and readership of *Network World* among ICA members have steadily increased since July 1986. However, during this time period, these same ratings have declined for almost every other communications-oriented publication.



* Readership figure for each publication is based on the number of ICA members who receive that publication.
Studies conducted by First Market Research of Boston.

There's no question about it. *Network World's* in-depth networking coverage is what enables us to deliver a unique editorial product that progressive communications users have come to rely on week after week.

Thanks to the growing support of ICA members and continued dedication of all our readers, *Network World* is now the number one communications-oriented publication for today's leading-edge users.

Cordially,

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Publisher

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COMMUNICATIONS MANAGER

► INFORMATION SYSTEMS OVERHAUL

Hospital net to cut costs

Plans distributed processing over baseband LAN backbone.

BY MICHAEL FAHEY
Senior Writer

ROCHESTER, N.Y. — To achieve its goal of delivering lower cost medical care while meeting state and federal regulatory standards, Rochester General Hospital here is rewiring its facilities to accommodate the latest in hospital information system technology.

Hospital officials expect that the \$1.5 million project to install a hospitalwide net supporting an upgraded information system will cut costs and offer a three- to five-

year payback, according to Gerard Tusch, senior hardware/software systems analyst programmer.

The hospital's strategy calls for replacing its Digital Equipment Corp. System 10 mainframe with a network-supported, multivendor, distributed processing scheme. The system overhaul is expected to take two years, Tusch said.

To implement its distributed processing strategy and to ensure that it is capable of accommodating future hospital communications requirements, Rochester General is installing a baseband fiber-

optic backbone network from Ungermann-Bass, Inc. and the IBM Cabling System.

The hospital began installation of an Ungermann-Bass Net/One local network two months ago. The Net/One, which will be implemented using fiber-optic cable from AT&T, will form the backbone of the hospital's network.

Tusch likened the hospital's planned fiber installation to a superhighway. He said the IBM Cabling System would act as a secondary road giving users throughout the hospital access to fiber.

“Communications is a strategic business weapon, and a knowledge of the intricacies of tariffs and regulatory matters is as important to the communications manager as a knowledge of the tax code is to the chief financial officer.

Robert Ellis
President
The Aries Group, Inc.
Rockville, Md.

The IBM Cabling System will be linked to the hospitalwide fiber-optic backbone using SynOptics Communications, Inc.'s LattisNet. The shielded twisted-pair IBM cable includes separate wire pairs for voice and data. The hospital does not switch data through its private branch exchange.

The network will support a wide variety of devices. In addition to the small mainframes or minicomputers that will replace the hospital's current DEC mainframe, the network will support personal computers, terminals and medical and laboratory equipment.

Microcomputers in the nurses' stations, likely to be IBM Personal System/2 computers, will be connected to the network and will enable doctors and nurses to receive and update patient information, See page 26

GUIDELINES TOM Y. RUSH

If you don't know where you're going . . .

Alice, in *Through the Looking Glass*, seeks help in choosing the best route for her journey. When asked where she wants to go, she replies that she doesn't know. She is then assured that she is fortunate, since any road will take her there.

The same thing can be said of strategic planning. You have to know where you want to go to choose the best way to get there. If you want to control your destiny, you have to make decisions based on knowledge about your company's planned directions, the most probable changes in technology and a well designed communications plan.

It is vital for communications managers to participate in both corporate and information systems strategic planning in addition to communications planning.

Today's corporate management is realizing the vast role of technology in restructuring corporate America. Popular business books and publications cite examples of the use of technology for a competitive advantage — American Airlines, Inc., American Hospital Supply Corp., McKesson Corp. These companies use communications as a major strategic weapon.

Unfortunately, there are communications managers who either are not

doing their reading or are not applying the lessons offered by these forward-thinking companies.

A recent Gartner Group, Inc. study notes that many Fortune 1,000 companies today spend more on communications than on data processing. Yet, in many of these same companies, the data processing director plays a much larger role in strategic planning than does the director of communications.

Communications planning, while similar to data processing planning, forces consideration of many more complex variables. Both have vendors to consider — hardware and software — but the communications manager must also consider carriers, tariffs, transmission media, Post Telephone and Telegraph administrations, local-area networks and a much wider range of standards.

Astute communications managers are realizing the impact they can have in shaping long-range plans and are taking the risks inherent in assuming a leadership role. Other more complacent or timid communications managers are satisfied to observe the status quo, fight day-to-day tactical fires and avoid executive management.

While this may appear to be a safe — although not very challenging — course of action, strategic planning is not an activity that can be relegated to the back burner. Communications managers who do not take an active role — not only in communications strategic planning, but also in corpo-

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1987 Association of Data Processing Service Organizations' salary survey

	Average salary range		Number of respondents
	Minimum	Maximum	
Senior telecommunications programmer/analyst	\$32,700	\$51,100	139
Intermediate telecommunications programmer/analyst	\$25,200	\$40,900	287
Associate telecommunications programmer/analyst	\$22,500	\$35,500	484

SOURCE: ASSOCIATION OF DATA PROCESSING SERVICE ORGANIZATIONS, INC., ARLINGTON, VA.

► USERS GROUPS

Users of DCA T-1 mux hold meeting

BY MARY LINEHAN
Staff Writer

SAN DIEGO — The newly formed DCA T-1 Users Group recently held its first meeting to discuss goals and to begin working “together toward the common goal of using this technology more effectively,” according to Victoria Blackford, vice-president of data communications at Chase Manhattan Bank and a charter member of the group.

The group, actually a subgroup of the larger Digital Communications Associates, Inc. Users Group, met here following the recent Telecommunications Association conference. According to Blackford, nearly 15 user companies were represented at the Oct. 2 meeting. She would not name any of the companies represented, nor would she comment on the number of people who attended.


Blackford said group members were seeking a forum to discuss common concerns. “We wanted to talk about issues of interest to DCA/Cohesive T-1 mux users,” Blackford said. “It's nice to be able to present a unified front to DCA/Cohesive.” DCA bought Cohesive Networks Corp. about a year ago, and the T-1 multiplexer is often referred to as a DCA/Cohesive product.

According to a spokesman, “The DCA Users Group has been in existence for the last two years, and it was brought to our attention that the T-1 users wanted to start a subgroup of their own,” he said.

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Rush is a partner in the managing consulting services arm of Coopers and Lybrand's Northeast Region Software Development and Network Services Practice.

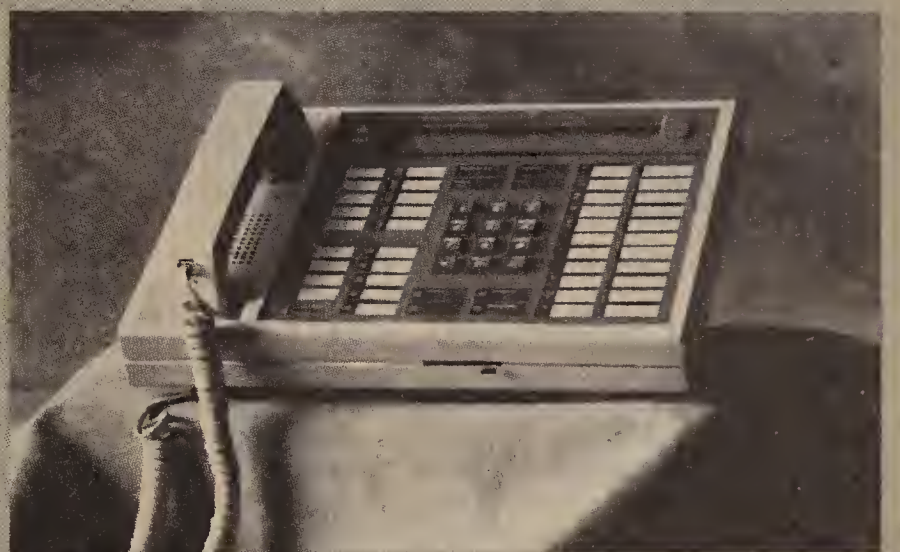




“I called three times and got cut off three times. Then I thought, what if I'd been a customer? Would I have bothered?”

My plane was late so I wanted to let the office know. Well, I'm trying to call but nobody's picking up. I start counting the rings and I'm up to 12 when, finally, somebody picks up and mumbles "lobby." Then click, I'm disconnected. Three times in a row this happens. And I'm just about to boil. I'm thinking, what's happening to other callers? How many sales are falling through the cracks? Why did we ever gamble with this cursed phone system when we knew

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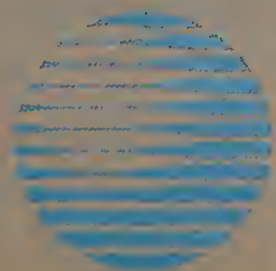
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If you don't know where . . .

continued from page 23

rate and information systems strategic planning — will see their positions weaken.

In essence, if communications managers do not participate in the corporate planning process, someone else will assume their role. Communications managers must take an active leadership role or be left to fight the tactical fires that will be the end result of an inadequate plan.

For example, only communications managers have an adequate understanding of the time it takes to get a sophisticated communications system up and running. Tak-

ing an early role in company expansion plans will prevent incorrect estimates of the time involved in delivering communications services to the end user.

Recent developments on Wall Street offer an opportunity for communications managers to expand their vision beyond technology. Communications managers would be wise to keep an eye on economic indicators while researching the effects of a possible recession on their organizations' communications needs.

One need not be an economist to understand the state of the economy and its effects on one's business before making future communications plans. It just makes good business sense. **Z**

Hospital net to cut costs

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according to Tusch. Currently, most of the information added to the network is done by a batch process.

About a year ago, the hospital installed a broadband local network from Ungermann-Bass on a trial basis. But, Tusch said, baseband offered higher data rates. In addition, plans to use the broadband system to operate remote security cameras were scrapped, making the baseband system more attractive, Tusch said.

The hospital also plans to install an IBM Token-Ring Network in its nearby doctors' office building.

The Token-Ring Network may eventually allow doctors to access digitized X-rays remotely from the hospital's radiology department. Digitized X-ray technology has not yet been perfected but is expected to be available within two to three years, according to Tusch. Tusch said he is exploring the possibility of installing a 16M bit/sec Token-Ring Network from IBM in the doctors' building. He said he hopes new data compression techniques will allow the Token-Ring Network to provide enough bandwidth to carry the X-ray images.

In addition to digitized X-ray technology, doctors are becoming increasingly interested in the use of personal computers to access patient information available on the hospital information system, Tusch said.

Having remote access to X-rays and to patients' hospital records frees up doctors' time and allows them to devote it to other aspects of their practices, according to Tusch. "If we cannot provide these services to doctors," he said, "they may go to other hospitals."

By using three to five minicomputers or small mainframes from a variety of vendors, the hospital will be better able to use application software designed for use in various hospital settings, Tusch said.

Software philosophy

"Our philosophy is to find the best software package available for the job and run it on the hardware recommended by the vendor," Tusch said. For example, he said, if the hospital finance department found that IBM equipment best accommodated the software that met its needs, while Data General Corp. gear was best for running the hospital's laboratory software, each department would be supplied with the hardware that is best for running the appropriate application software.

"In the past, we wrote our own software," Tusch said. "But that just takes too much time, and we have only five programmers. Now we let the user department pick out the best software to meet its needs." **Z**

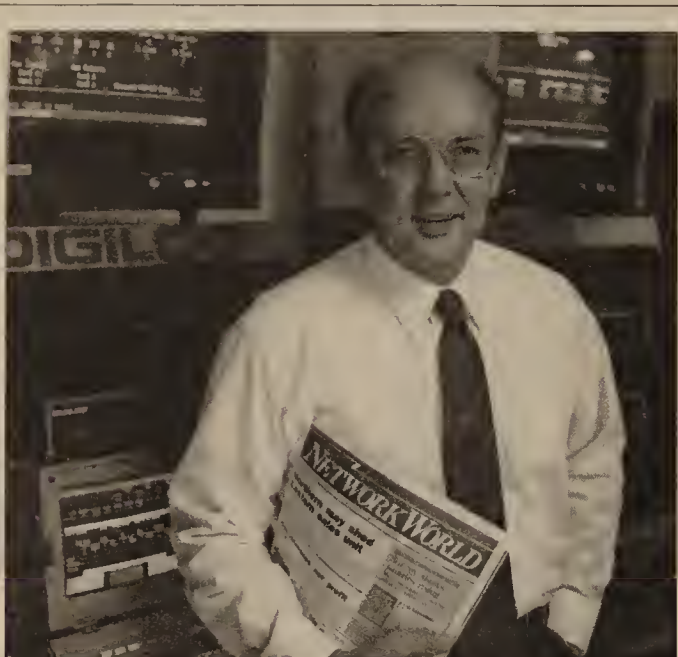
DCA T-1 Users Group meets

continued from page 23

"T-1 networks are very high-ticket items, and these users feel they have a lot they can learn from each other — like monitoring the networks and cutting in new services," the spokesman said.

"I thought the first meeting was very helpful, but it could have been more widely supported," said Fred Mueller, a senior communications analyst for Fidelity Investments. "I made some good contacts. This kind of group is the best way to prevent making the same mistakes that others have. We'll be represented at future meetings."

The group's second meeting will follow the Communications Networks '88 show, which will be held Jan. 25 to 28 in Washington, D.C. **Z**



Roy Gemberling, V.P. and General Manager, Digilog Inc.

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NEW PRODUCTS AND SERVICES

Coming up in the Nov. 16 issue:
►Special Section on factory communications

►PRODUCT ROUNDUP

Bevy of peddlers parade wares at Comdex/Fall'87

BY JIM BROWN

New Products Editor

LAS VEGAS — Local network bridges and communications products for IBM's recently announced Personal System/2 microcomputer were among the slew of communications products announced last week at the Comdex/Fall'87 show here.

Microcom, Inc. of Norwood, Mass., introduced LAN Bridge, a device that links Ethernet or token-ring networks, via dial-up or leased lines, at speeds up to 112K bit/sec. The bridge includes a built-in modem that supports Microcom's Microcom Network Protocol (MNP) error-checking scheme.

LAN Bridge uses a proprietary algorithm to detect and compress data packets destined for remote local nets and to transparently route those packets to the appropriate networks. The product passes data packets between networks running Novell, Inc.'s NetWare, 3Com Corp.'s 3+ and Digital Equipment Corp.'s DECnet operating systems. It also provides links between networks supporting the Transmission Control Protocol/Internet Protocol.

The bridge consists of three

parts: the Wide-Area Network Module, which uses MNP to control telephone links between networks; the LAN Interface Module, which captures local net data packets destined for remote networks; and the Bridge Management Module, which manages the establishment of dial-up links, controls the general operation of the bridge and tracks local- and wide-area network statistics.

The product comes in three models, each of which will ship in early 1988. The \$5,499 MLB/1000 supports links at speeds up to 19.2K bit/sec, the \$7,499 MLB/2000 supports speeds up to 56K bit/sec and the \$8,999 MLB/2500 uses data compression to support speeds up to 112K bit/sec.

IDEAssociates, Inc. of Billerica, Mass., released two terminal emulation boards compatible with IBM's Personal System/2 micro channel architecture. The boards enable IBM Personal Computers or Personal System/2s to emulate IBM 3278 or 3179 terminals and attached printers to emulate IBM 3287 system printers.

The IDEAcomm 3278/DFT supports up to five host sessions via a coaxial cable link to a host, and the 3270/SNA, which emulates an IBM

3174, 3274 or 3276 remote terminal controller, supports up to eight terminal sessions. Both products feature a hot key enabling users to toggle between sessions. A new file transfer program dubbed IDEAFT enables 3278/DFT and 3270/SNA users to transfer files with mainframes running TSO, VM/CMS and CICS.

IDEAcomm 3278 board users can upgrade to 3278/DFT software. Pricing for 3278/DFT and 3270/SNA has not yet been set.

10NET Communications, formerly Fox Research, Inc., the Dayton, Ohio-based division of Digital Communications Associates, Inc., introduced a network adapter board compatible with the Personal System/2's micro channel bus architecture. The new board will enable Personal System/2s to be supported on the same twisted-pair wire 10-NET network as IBM Personal Computers.

Scheduled for shipment in March 1988, the new board and 10-NET software will sell for \$695.

Proteon, Inc. of Westborough, Mass., introduced a set of repeaters that replace existing models used with its 10M bit/sec ProNET-10 token-ring network. The new repeaters will extend the distance

of ProNET-10 by 1,300 feet.

Available in four-, eight- and 12-port versions, the p2440 Series Repeater Wire Centers replace p2420, p2430 and p2460 models. Each port on the new models can link a device to a backbone ProNET-10 network.

The four-port p2441 is priced at \$685, the eight-port p2442 is \$980 and the 12-port p2443 is \$1,275.

Acer Technologies Corp. of San Jose, Calif., introduced an Intel Corp. 80386-based file server dubbed the Acer 1100/20. Acer also released its 5280 AcerStation diskless workstation and 2,400 bit/sec modems. The 1100/20 comes with 12M bytes of random-access memory and supports optional disk storage capacity of 70M bytes, 135M bytes or 340M bytes. The file server, which can be used in Ethernet or Arcnet networks, retails for \$6,695.

The firm's 5280 AcerStation diskless workstation uses an Intel 80286 microprocessor with 512K bytes of RAM, expandable to 1M byte. It comes with either a built-in Ethernet or Arcnet network adapter board. The workstation also supports a parallel and serial port. Available early in 1988, a unit with an Ethernet card will cost \$1,895, while a version with an Arcnet card will cost \$1,795.

The firm's 2400/PC modem comes in personal computer board-based and stand-alone versions, each of which supports speeds of 2,400 bit/sec. Compatible with Bell 103, Bell 212 and CCITT V.22 standards, both units feature digital and analog loop-back tests. The board-based version is \$279, and the stand-alone version is \$329.

Cermetek Microelectronics, Inc. of Sunnyvale, Calif., announced three asynchronous 9.6K bit/sec modems compatible with the CCITT V.32 standard. The modems include the \$1,295 personal computer-based 9600PC, the \$1,595 stand-alone 9600DA used in dial-up applications, and the \$1,995 stand-alone 9600FR, which supports fallback rates of 4.8K bit/sec, 2,400 bit/sec, 1,200 bit/sec and 300 bit/sec.

Each supports full-duplex transmission and is compatible with Hayes Microcomputer Products, Inc.'s AT command set. The modems also support trellis-coded modulation, adaptive equalization, echo cancellation, call progress detection and autodial and auto-answer features. Each modem can be ordered with support for either the Bit-Oriented Link Access Procedure or MNP error-checking schemes.

In addition to V.32 support, the 9600FR supports V.22 operation via dial-up or two- or four-wire leased lines. □

►TERMINAL EMULATION

Novell unveils Mac-to-IBM board

BY JIM BROWN

New Products Editor

MOUNTAIN VIEW, Calif. — Novell, Inc.'s Communications Products Division recently announced a terminal emulation board that enables Apple Computer, Inc. Macintosh II microcomputers to communicate with IBM mainframes.

The Pcox/Coax-M board is compatible with the Macintosh II NuBus and is linked to an IBM 3174 or 3274 terminal controller via an IBM Category A coaxial cable connection. The board uses an Intel Corp. 80186 microprocessor and 512K bytes of random-access memory to perform protocol processing.

Pcox/Multi-M software, which resides on the Macintosh II, works with the board to make

the Macintosh II appear to an IBM mainframe as an IBM 3178, 3179, 3278 or 3279 terminal. It supports up to five concurrent host sessions.

Pcox/Multi-M implements a subset of Microsoft Corp.'s MS-DOS operating system that consists of a control program that enables the board to implement the IBM Systems Network Architecture protocols needed to link to the terminal controller. It also performs EBCDIC-to-ASCII data format conversion.

The firm announced its Pcox/3270 SR-M software, which works with the emulation board to enable a Macintosh II user to transfer both binary and text files using IBM hosts. The software establishes a link with either IBM's 3270 Host File Transfer Program or Pcox/CXI\$file file

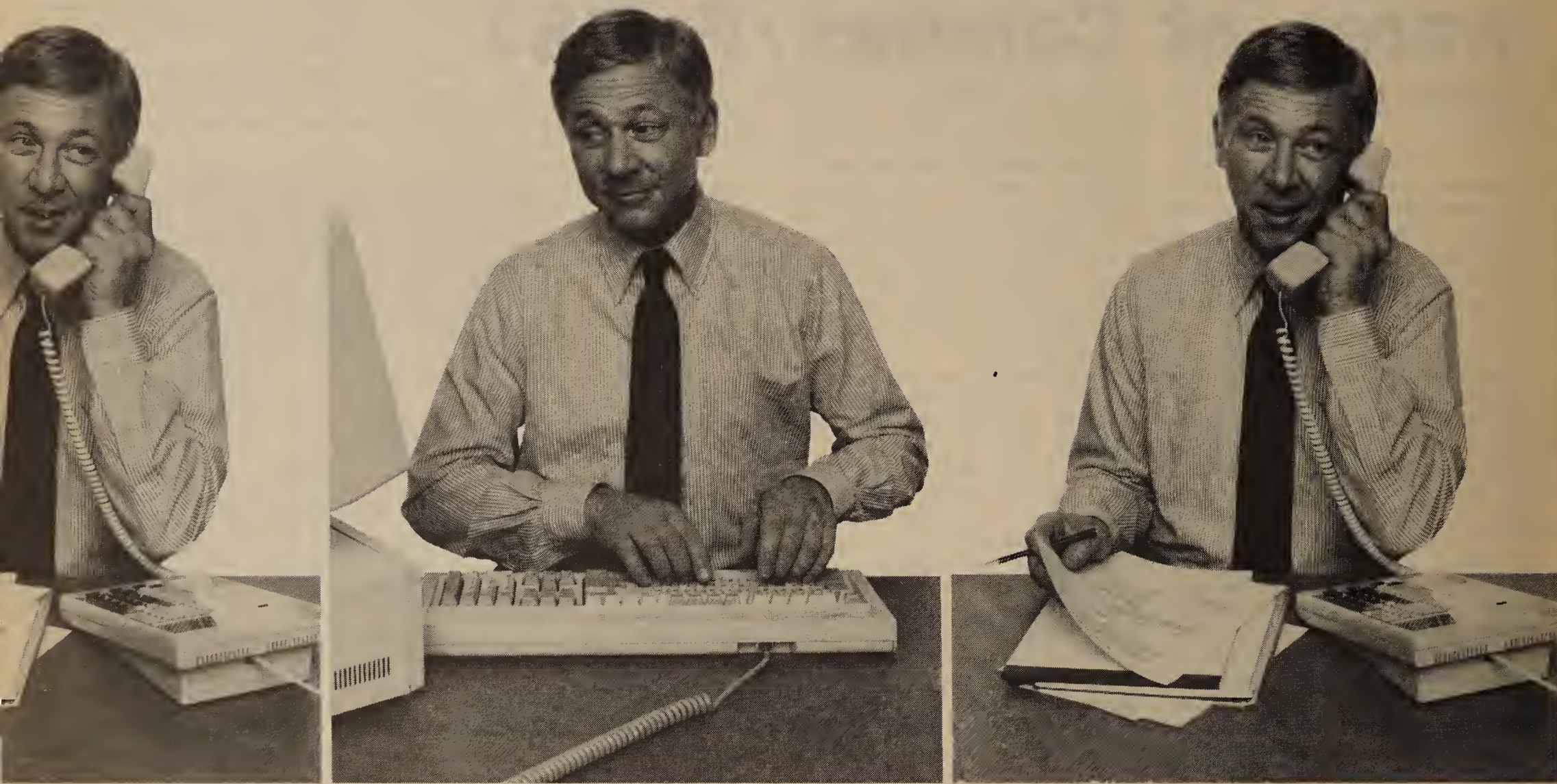
transfer software on IBM mainframes running under TSO or VM/TMS. The new board is also capable of running Pcox/3270 SR-M in background mode, enabling Macintosh II users to upload or download files to the mainframe while processing other applications.

Novell's Communications Products Division was formed following Novell's acquisition last March of CXI, Inc.

Scheduled to be available later this month, the Pcox/Coax-M board lists for \$495, while the Pcox/Multi-M software costs \$675. Pcox/3270 SR-M file transfer software lists for \$100.

Novell's Communications Products Division is located at 1157 San Antonio Road, Mountain View, Calif. 94043, or call (415) 962-1999. □

The new IBM 9750 Business Communications System.



For everybody who wants more flexible computer networks, IBM has an answer: more flexible *telephone* networks. Even better, we've made them a reality.

Introducing the IBM 9750 Business Communications System and its centerpiece, the new IBM 9751 CBX.

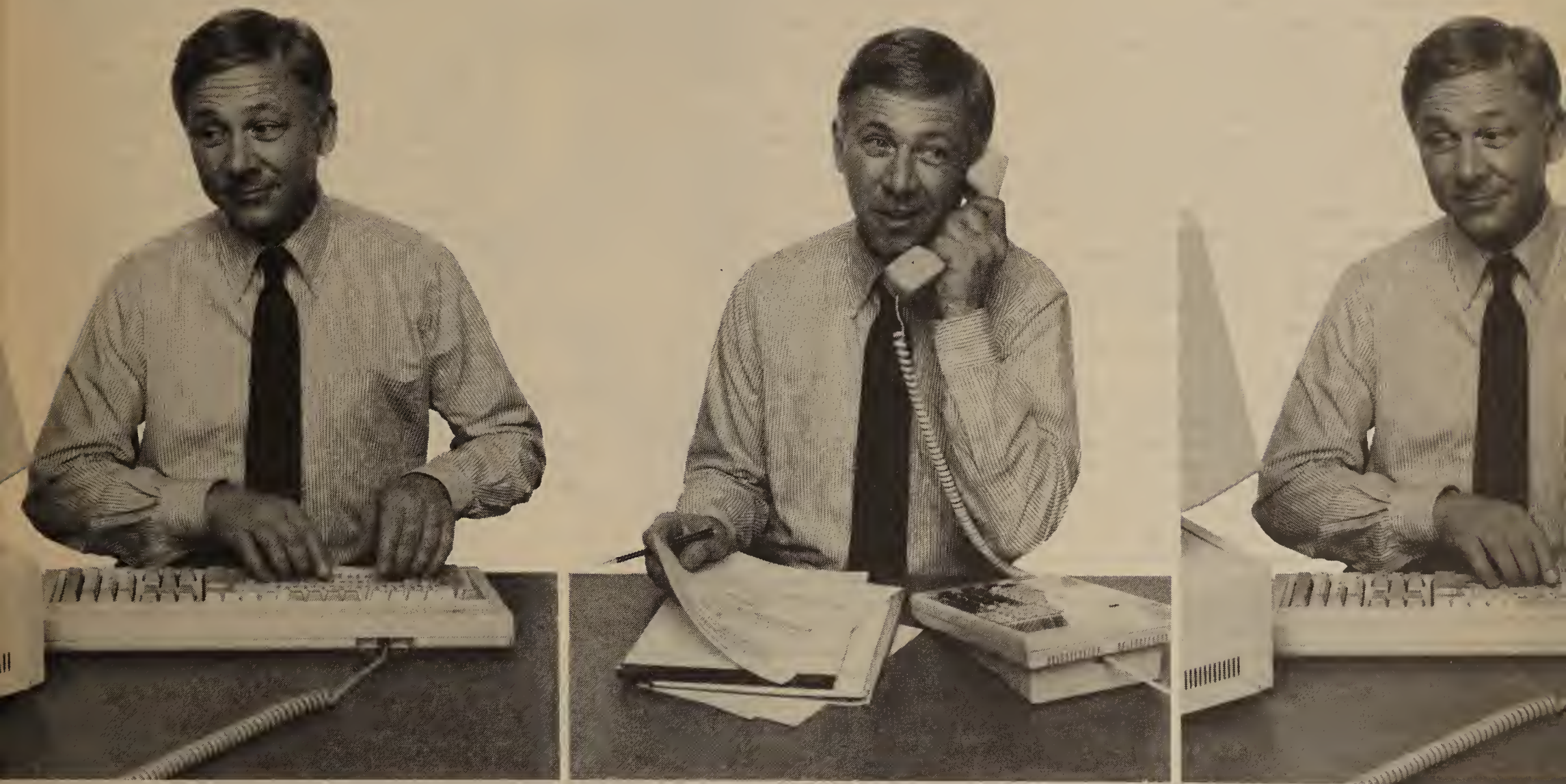
Developed by ROLM, they give you powerful digital voice switching capability, plus data connectivity for virtually any desk that has a phone on it.

Unlike other telephone switches (or PBXs), the IBM 9751 CBX comes with nearly every line "data-ready." So when you hook up your phones, you get computer connectivity in the bargain.

That way, you no longer have to decide in advance exactly how every single workstation ought to be networked. You have the flexibility to connect occasional (or unexpected) users, easily and economically. With an IBM 9750 fully installed, you can open your data resources to more people who need them, without spending to equip areas that may never need them.

Even if you use it for voice only, the IBM 9751 CBX will keep you years ahead. It's one of the most expandable systems in the industry, able to serve from 100 to 20,000 lines. So as you

Any connection between voice and data is purely intentional.



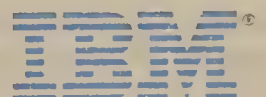
grow, it grows. Yet it's much smaller than its predecessor, the ROLM CBX II, and it's easier on power and air conditioning.

On the other hand, its traffic-carrying capacity is tremendous. The 9751 can be configured so it's virtually impossible to block.

And its 9000AE (for Advanced Engine) processor not only gives you every digital advantage (like ROLM PhoneMail® and Least Cost Routing), it has reserve power to handle these applications under heavy use and to let you add new applications as you need them.

When ISDN standards are established, the IBM 9751 will be able to work with them. It was built with ISDN in mind, to provide both the power and bandwidth that ISDN usage (for voice, data and image) will demand.

In fact, the 9750 Business Communications System is a key part of IBM's telecommunications future. Combined with all of IBM's other ways to connect systems, it gives you new freedom to run things your way, to broaden the usefulness of your networks, and to control their expense. To learn more, call your IBM ROLM Systems representative or Authorized ROLM Distributor.



Opinions

FCC UPDATE

ALAN PEARCE

Then there were three

The premature, though not entirely unexpected, resignation of FCC Commissioner Mimi Weyforth Dawson puts Chairman Dennis Patrick in a policy-making dilemma. This dilemma could stop the young chairman in his tracks and prevent him from making any lasting imprint on the structure of the telecommunications and information industries.

Currently, there are only four FCC commissioners. Patrick and Dawson are Republicans; Jim Quello and Patricia Diaz Dennis are Democrats. Patrick has been waiting since April of this year for President Reagan to name the fifth commissioner and the third Republican. Dawson's imminent departure to the Department of Transportation, where she will be the deputy secretary, reduces the number of policymakers at the commission to only three, during a particularly critical policy-making period.

The next 12 months will be critical for Patrick for two reasons:

- He wants to push through major regulatory reforms, particularly concerning alternatives to rate base rate-of-return regulation (FCC Docket 87-313), the possible imposition of access charges on enhanced services providers and private networks (FCC Docket 87-215) and the implementation of the Third Computer Inquiry beginning in February 1988.

- He may run out of time in his efforts to make an impact on telecommunications poli-

cy, especially if the Democrats capture the White House in 1988, in which case they will quickly remove him and change the FCC's policy-making direction.

Consequently, Commissioner Dawson's resignation puts Patrick into something of a hole. It is unlikely that Congress will permit him to make important long-term policy-making decisions with FCC membership down to three.

Patrick, however, may be saved by Reagan, who could make two quick recess appointments to the commission when the Senate adjourns in November. Recess appointees are named during a Senate recess and perform their duties until the Senate reconvenes and holds a confirmation hearing to confirm or deny the appointment.

President Reagan's procrastination in naming commissioners is not due to a lack of qualified candidates. Bradley Holmes, a former aide to Patrick and now head of the FCC Mass Media Bureau's policy and rules division, was reportedly the president's choice to become the fifth commissioner, but Reagan has yet to nominate him.

Now that the president must make an additional selection, names for the fifth commissioner's slot being examined include Susan Wing, an attorney at the Washington law firm of Hogan and Hartson; Robert Pettit, a former aide to Dawson and now with the law firm of Wiley, Rein and Fielding; Rodney Joyce, a former deputy head of the National Telecommunications and Information Administration, who is currently an attorney with Finley Gumble; and Allen Moore,

minority chief of staff of the Senate Commerce Committee. All of them, needless to say, are Republicans and eager to join the FCC.

Even if the president makes two quick nominations from this list of qualified candidates, the FCC will not be up to full speed. The two new commissioners will have to select members for their own staffs, become familiar with current FCC policy-making initiatives across a broad spectrum of issues and generally "bat themselves in" slowly, largely because telecommunications policy today is complex and often esoteric. As a consequence, the FCC will be slowed at a time when Patrick wants to hasten, not only because there are important policies to be decided, but also because he may have too little time left to make an impact.

It will take much of Patrick's youthful tenacity and enthusiasm to overcome the obstacles the Reagan administration has unwittingly thrust upon him. But because the chairman is only 36 and because he has assembled a talented and exuberant staff, Patrick may be able to cope with a three-member commission, notwithstanding the opposition of Congress.

Although puttering along with only three members is not preferable, it is workable. Under FCC rules, three commissioners constitute the quorum necessary to take policy action. Nonetheless, it is obvious that Patrick would prefer to be at full strength — and only an embattled, lame-duck White House can come to his rescue on that particular problem. □

Pearce is president of Information Age Economics, a telecommunications research firm in Washington, D.C.

NETWORK MANAGEMENT

SHARLENE SUE

No network nirvana

Network managers, encouraged by vendors, have been on a futile quest for network nirvana. Managers have come to believe that all their network management problems will be solved if they just wait for the next enhancement, the final version or the latest product announcement.

In this utopian environment, managers would monitor and control their univendor networks from a single, centralized workstation using universally compatible and globally utilized transmission standards and computer protocols.

The concept sounds great, initially. But in reality it doesn't exist, and its pursuit ends up being counterproductive for the network manager.

The value and necessity of network management planning is in-

disputable. The problem is that many organizations continue to wait and forgo making any commitments while chasing after the ideal automated network management system.

The cost of waiting for one more standard to be finalized and an additional software enhancement to be available can be steep. The window of competitive opportunity may be closing in the manager's industry. Network managers should act to implement the best possible automated network management options available today.

What plagues net managers

Many aspects of network management plague managers and prevent them from using their networks strategically. Specifically, some of these decision bottlenecks have focused on issues such as how to cope with the following:

- Centralizing or decentralizing the automated network management system.

- Dealing with a multivendor environment.

- Adopting a standard.

There are no simple right and wrong answers to these issues. In fact, standards and multivendor questions pose a particularly difficult problem, as both are driven by external forces. The emphasis needs to be on thoroughly exploring the issues, making educated forecasts and taking action. By addressing these issues now, network managers can begin to reap the benefits of having a strategically planned automated network management system.

Should you centralize or decentralize your system? The current business environment increasingly requires a synthesis of centralization and decentralization in all aspects of the business, including automated network management.

Centralization can create economies of expertise. Corporations can ill afford to reinvent the network management wheel for each merg-

er, acquisition or system implementation. Decentralization, on the other hand, can lead to a decrease in system complexity and cost as well as an increase in a company's overall flexibility.

Can you live with a multivendor network? Multivendor environments will continue to exist for the foreseeable future. With this premise as a given, network managers need to implement strategies that will accentuate the positive aspects of a multivendor network while minimizing its downside.

Ideas stand for experience. Why not stand up for your ideas? Write a column for *Network World's* Opinions pages. Columns should express strong opinions on timely industry issues. Manuscripts must be letter-quality, double-spaced and approximately 700 words in length. Disk or modem submissions preferred.

Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 732.

Sue is a research associate at the International Center for Information Technologies in Washington, D.C.

Opinions

► TELETOONS — By Phil Frank



The benefits lie primarily in the area of vendor responsiveness and user flexibility.

Price and service can play a large role in distinguishing one product vendor from another in initial and subsequent purchases. The multivendor environment provides the competitive arena in which to make these comparisons.

In addition, a multivendor network provides managers with the flexibility to carve automated network management systems exactly to their companies' specifications, rather than living with whatever the single-source vendor can provide.

Admittedly, the negative side of dealing with a multivendor network is in compatibility and connectivity. This can be partially managed by purchasing only products that strictly adhere to recognized standards.

Standards to consider

Which standard should you implement? Since the International Standards Organization has not yet agreed to a standard structure for network management information, proprietary protocols abound. The best approach to standards is to

make an informed decision and implement it.

Some issues to consider are: allowance for exceptions (By allowing an exception, will you create an isolated island or a business opportunity?); degree of industry solidarity (Are the primary vendors in the industry centering on a formal standard?); and implications of intercompany networking (Will a particular standard allow you to communicate electronically with organizations external to your company, such as suppliers and distributors?).

In most corporations, the network has become an integral part of competitive strategy. Therefore, it cannot be allowed to become the weak link in the business chain. The decisions are complex and shouldn't be made in haste, but they must be made. The lead time necessary for implementing plans and changes precludes delaying these actions any longer.

If you wait for the perfect standards environment, the ultimate computer enhancement and the ideal time logistically to begin planning for your company's automated network management system, you will be too late. ▮

VENDOR STRATEGIES

JEFFREY A. MATROS

ISDN needs applications

The recent Telecom '87 conference in Geneva provided an illuminating view of where the convergence of computers and communications stands. It also showed that computer and communications vendors are taking two distinctly different approaches toward Integrated Services Digital Network and the office environment.

The predominant sales pitch from the world's leading communications companies involved Basic and Primary Rate ISDN Interfaces and provision of simultaneous voice and data over a single digital link.

Siemens AG, Ericsson, Philips Telecommunications N.V. and Northern Telecom, Inc. all touted ISDN-related features, but where were the applications? From AT&T, a company that's clearly a driving force behind ISDN, came this brilliant comment from a private branch exchange product manager who was asked why a user should buy an ISDN-compatible PBX: "To take advantage of the ISDN services in the network."

What services? What network? There are no ISDN lines available in my New York local exchange. How about yours?

It became clear early in the show that communications vendors were still selling hardware while computer companies were not. To be sure, IBM exhibited its 8750 PBX and talked a little about Basic and Primary Rate Interfaces. Wang Laboratories, Inc. discussed its plans to incorporate ISDN hardware into the Intecom, Inc. IBX, but its sales discussions with customers were application-oriented.

Applications. Now there's a word that should be taught to every employee of every communications vendor before it's too late. Anyone can build an ISDN Basic or Primary Rate Interface and associated software. Applications are the hard part.

Positive steps toward ISDN applications were taken at Telecom '87, and they were taken by computer vendors, not by communications companies.

Digital Equipment Corp. spoke of its Computer Integrated Tele-

phony program that's designed to "incorporate the unique capabilities of the data network and the telephone system into a seamless application environment so that the telephone and the terminal can work together as a single tool for the user."

Now we're talking. William Johnson, DEC's vice-president of distributed systems, went further, saying, "DEC believes the greatest benefits to the user will come from functional integration of voice and data at the application level."

Hewlett-Packard Co. discussed an ISDN product development strategy founded on customer problems of today, not just tomorrow. Wang talked of applications that integrate telephony and computer features such as electronic mail, voice messaging and centralized directory. IBM demonstrated multivendor support and participation in a Net-View/PC-based integrated network management system exhibition. Again, solutions and applications.

ISDN won't mean anything to communications managers until ISDN applications help solve existing and predicted problems.

Pity the poor managers who schlepped to Geneva to find out firsthand what's coming down the ISDN highway.

A walk through the communications vendors' exhibits gave them all the 2B+D and 23B+D they could stand. "Where's the beef?" they asked.

To their surprise, the vendors are talking turkey: "What business are you in? How is your net used? What applications are you running on your PBX?"

Computer companies have traditionally sold hardware through the sale of applications and solutions, while communications vendors have relied too heavily on price-based hardware sales. As computer and communications technologies converge, the hardware differences between the two will decrease.

Communications vendors must start understanding their customers' businesses and learning what applications they can provide via their vaunted ISDN-compatible systems. If they don't, ISDN may provide computer companies with a golden opportunity to make inroads into what was once communications territory. ▮

Matros is an independent consultant working with Quantum Consultants, Inc., an information technology consulting firm.

Features

November 9, 1987

► INTERVIEW

Rule of Justice

Charles F. Rule is the Assistant U.S. Attorney General in charge of the Department of Justice's Antitrust Division. He heads the team of attorneys and economists responsible for administering the Modified Final Judgment, the rules that have governed the regional Bell holding companies since the breakup of the Bell System in 1984.

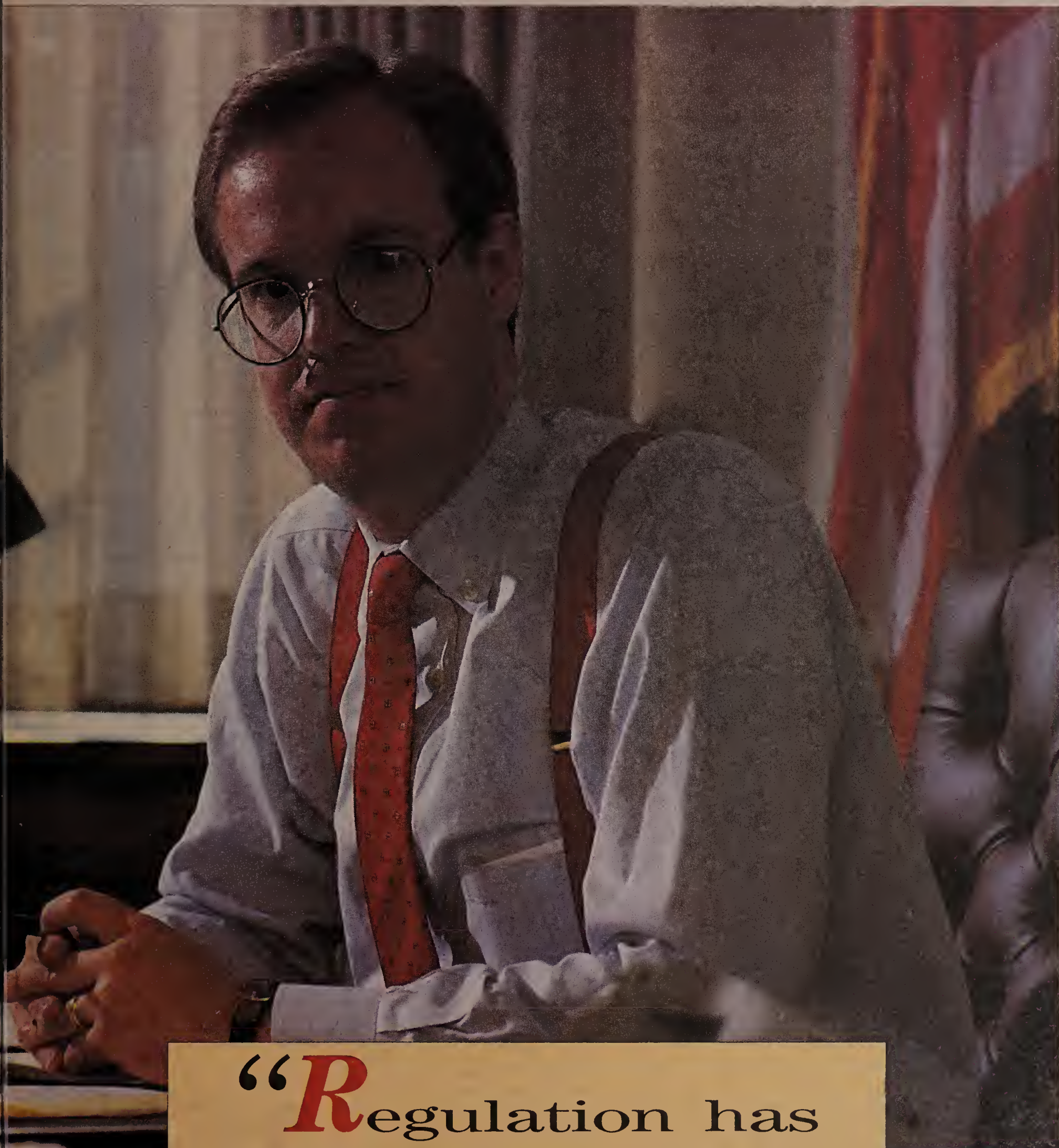
Under Rule's direction, the Antitrust Division recommended earlier this year that the RBHCs be freed from the Modified Final Judgment restrictions that prohibit them from competing in the long-distance, information services and telecommunications equipment manufacturing businesses.

Rule was confirmed in his current post by the U.S. Senate in August. He had served as the acting head of the Antitrust Division since November 1986. Rule has been with the Antitrust Division since 1982, first serving as special assistant to then Assistant Attorney General William Baxter. His knowledge of AT&T regulatory issues dates back to the 1982 settlement of the AT&T antitrust suit, although he didn't begin working directly on the case until 1984. Rule holds a bachelor's degree in history from Vanderbilt University and a law degree from the University of Chicago.

Rule, who is a strong supporter of telephone industry deregulation, met with Network World Washington, D.C. Correspondent Karyl Scott shortly after U.S. District Court Judge Harold Greene issued his much-anticipated order on the Modified Final Judgment. Greene's order rejected Justice Department recommendations and retained most of the original prohibitions on the RBHCs.

Continued on page 34





“*R*egulation has imposed a high cost on this industry and will continue to do so.”

PHOTO ©1987 WALTER P. CALLAHAN

From page 32

What was your reaction to Greene's decision to maintain the long-distance, equipment manufacturing and information services restrictions on the RBHCs?

The judge's decision wasn't what I expected. We were disappointed. We were very serious and sincere about the recommendations we made. We felt our recommendations were the most consistent with the standards Judge Greene established in the consent decree and with the facts surrounding the issue of competition in the telephone industry. We still believe we were correct in our recommendations.

It's ironic that in 1982 we asked Judge Greene to bar the RBHCs from all businesses outside of local telephone service, but he rejected that and decided to let them into the customer premises equipment business and Yellow Pages.

He also established the waiver provision that allowed him to consider RBHC requests to enter other businesses on a case-by-case basis. It seems like a complete role reversal.

Can you explain the antitrust standard in the consent decree?

The antitrust standard looks at competition in competitive telecommunications markets. It's not about regulation in regulated markets — that's what the Federal Communications Commission deals with.

The decree states that, in order to allow the RBHCs to enter long-distance, information services or equipment manufacturing markets, they must no longer possess the ability or incentive to use their local monopolies to gain unfair advantage in unregulated markets.

Does Greene's rejection of the Justice Department's conclusions about telephone industry competition and RBHC monopoly power undermine your ability to make future determinations on the Modified Final Judgment and the RBHCs?

I don't think so. We applied the antitrust standard consistent with the decree. We will continue doing what we've been doing, and I'm sure we'll make our recommendations again in 1990 in the next triennial review of the MFJ.

It seems that Greene's interpretation of the decree differs vastly from the Antitrust Division's. How can the two be so far apart in their interpretation of the same rules?

Well, that's what interpretations are. We felt it was inconceivable to think the RBHCs could harm competition in the manufacturing and long-distance markets, given the state of competition in those businesses. It's unlikely that RBHC presence in these markets would distort competition as a result of any sort of cross-subsidy, because you have seven RBHCs, rather than one large one; you have an FCC that's fairly committed to preventing cross-subsidy; and you have an incredible amount

of scrutiny of RBHC operations.

The notion that the Bell companies are going to enter a market and snuff out competition is nuts.

Do you mean that the possibility of cross-subsidization doesn't exist?

No. Judge Greene points out, and we agree, that there's a risk that ratepayer revenues will be used to subsidize unregulated ventures. That's not something we like. We think action ought to be taken to protect ratepayers, and that's what the FCC and state reg-

The AT&T decree has been blamed for virtually every problem in the telecommunications industry, and it simply isn't responsible. It serves as a convenient whipping boy.

ulators are for. They have a range of weapons they can use. The AT&T antitrust case was never about the failure of FCC rules to prevent cross-subsidy or about the need to replace FCC rules with the Justice Department rules.

How did you interpret Greene's information service order? It seems he wants to allow the RBHCs to provide transmission facilities to information service providers in order to hasten the development of the information services industry, but he also seems to want to bar them from developing and marketing information services. Is this possible, and where do you draw the line?

Our concern is, exactly where does Judge Greene intend to draw the line between information services and transmission services for those information services? We're studying it now. We don't know where the line will be drawn.

We don't know how difficult it will be to make that determination or how difficult it will be to enforce.

During oral arguments, Greene kept asking if this was the same Justice Department as the one that recommended the breakup of the Bell System in 1982. Is this a different Justice Department in terms of antitrust philosophy?

There's no question that we've evolved over the last five years. The fact is that we wouldn't be doing a very good job if we hadn't learned something since we proposed the decree. The decree entailed a radical restructuring of the telecommunications industry, which led to significant changes in the Bell companies. Since the decree was entered, we've gained experience and evidence that has made us reach different conclusions than we did in 1982.

Some observers suggest the Justice Department's current position toward the RBHCs is based less on antitrust law and more on

Reagan administration policy objectives. Do you think that's a fair statement?

No. There were a lot of people within the administration who didn't like the divestiture in 1982. Others didn't agree with our recent recommendations to free the RBHCs from the MFJ restrictions. While we always listen to other members of the administration — particularly on the ramifications of our decisions on national security, international trade and telecommunications policy — ultimately, this is a legal case. The

Justice Department position represents the U.S. government, but the position we took shouldn't be interpreted as a policy position of the administration.

There has been criticism of Attorney General Edwin Meese over his ownership of RBHC stock. Has the attorney general removed himself from discussions about the Modified Final Judgment?

No, the attorney general has not been recused from the case; White House counsel said it wasn't necessary. It's been very helpful to be able to discuss an issue as important as this with the attorney general. It's ludicrous to argue that he's doing anything to further his own financial interest. That's not the way he operates.

The argument of whether he owns a small interest in a Bell company is a red herring. I don't think he even knew he owned the stock. Someone managing his finances bought the stock.

Observers have charged the Antitrust Division with being lax in the enforcement of the Modified Final Judgment. How do you respond to your accusers?

We receive dozens of complaints and allegations each week, and we deal with them as quickly as we can. We obviously have priorities and investigate the matters that are of the most wide-reaching importance. Our record on enforcement is a good one, but — let's face it — you don't make friends in law enforcement.

Do you think regulation of the divested Bell companies would be best left to the FCC at this time, or is there still a need for antitrust oversight by the Justice Department?

There's definitely a need for application of antitrust laws to long-distance, manufacturing and information services. To assume that the only time the antitrust decree can be lifted is when there's no longer a possibility of a violation

would mean you can never lift the decree, because there is no industry in this country in which an antitrust violation is inconceivable.

The question of whether we should be involved in policing local telecommunications services in relation to all other services is a different issue. We were supporters of the Dole Bill in 1986 that would have moved administration of the decree from the court to the FCC.

But does the FCC have the legal tools to prevent RBHC monopoly abuses? Should they concern themselves with this issue?

Prevention of monopoly abuse is another way of saying ratepayer protection, and obviously that's the FCC's main task. The FCC is in a much better position to protect ratepayers than the Justice Department or Judge Greene because the FCC has engineers, accountants and many more lawyers devoted to this subject. The FCC's expertise goes far beyond our limited antitrust focus. They truly are the telecommunications experts. I don't know if the FCC has adequate power to discipline the telephone companies if they violate the law, though. If not, Congress should give them the ability to do so.

Do you think market and technological forces are in conflict with government regulation of the telecommunications industry?

There's always a danger, particularly in an industry that's so technologically driven as the telecommunications business, that the cost associated with regulation will distort technology and market demand. Regulation has imposed a high cost on this industry and will continue to do so.

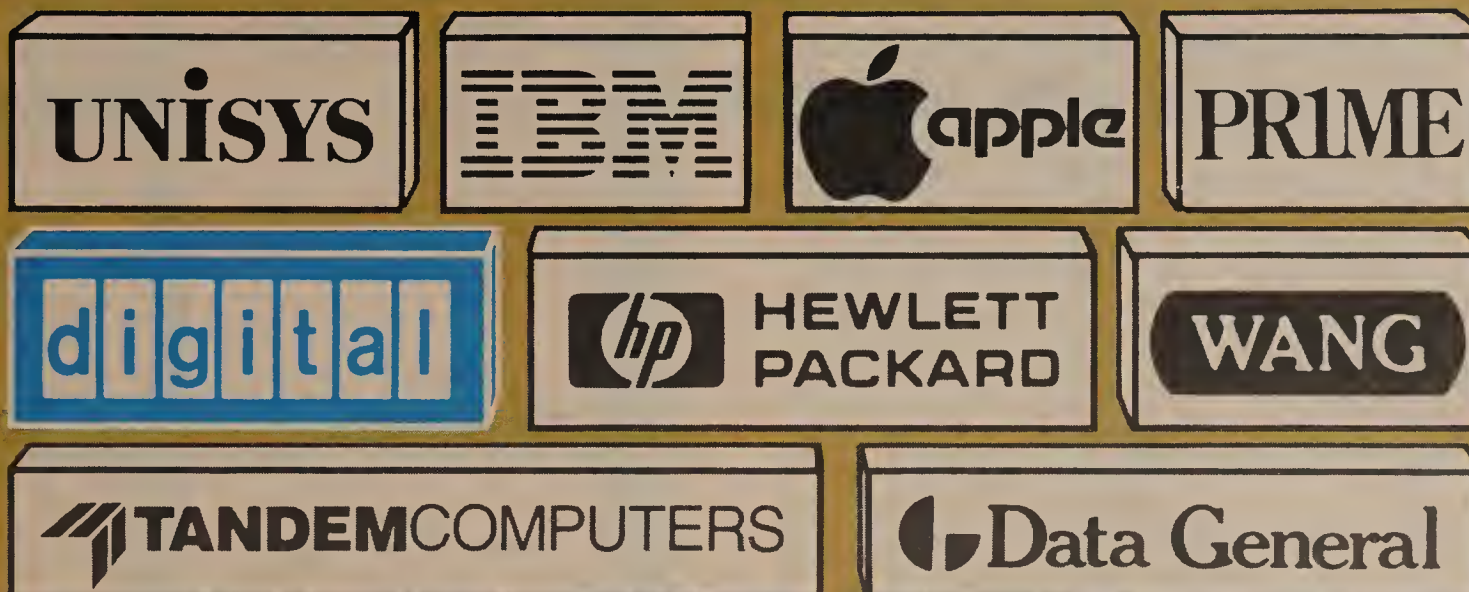
There's been little incentive for the development of technologies and services that would make various local services competitive because many states prohibit competition at the local level.

Some states are moving toward deregulation. This should bring about improvements in the business climate. I think the proposed change in rate-of-return regulation is perhaps the single most important development in the area of regulation and competition. I also think the movement to impose subscriber line charges is also important, although not terribly popular.

Do you think the American public is satisfied with the course of divestiture?

The AT&T decree has been blamed for virtually every problem in the telecommunications industry, and it simply isn't responsible. It serves as a convenient whipping boy because it's so famous and visible.

People don't look at more subtle causes: They forget the problems they had before certain things occurred; it's always "the good old days." It's much easier to see the problems than the benefits that were brought about. □



Open Systems: How open are they?

One network, indivisible?

Continued from page 1

and one networking system. The "one" strategy, as industry observers dubbed it, gave the company's product lines a coherence that went over big with users: no more hassles with multiple operating systems and incompatible communications protocols and a promise from DEC that all new products would be backwards-compatible. It's a formula some industry observers believe IBM is trying to duplicate.

Other observers criticize the "one" philosophy, equating it with a DEC-centric view of the world that contradicts the company's

stated policy of maintaining an open architecture.

DEC user Harvey Shrednick is one of the company's many proponents. "I feel very positive about the partnership we've developed between our two companies, especially in the office environment," says Shrednick, vice-president of information systems at Corning Glass Works in Corning, N.Y.

Like many large corporations, Corning Glass uses IBM equipment in its information services group, which supports many management functions. DEC VAXes, however, are used in many of the company's divisions and plants. Shrednick didn't want to force these users to convert over to IBM equipment. "I

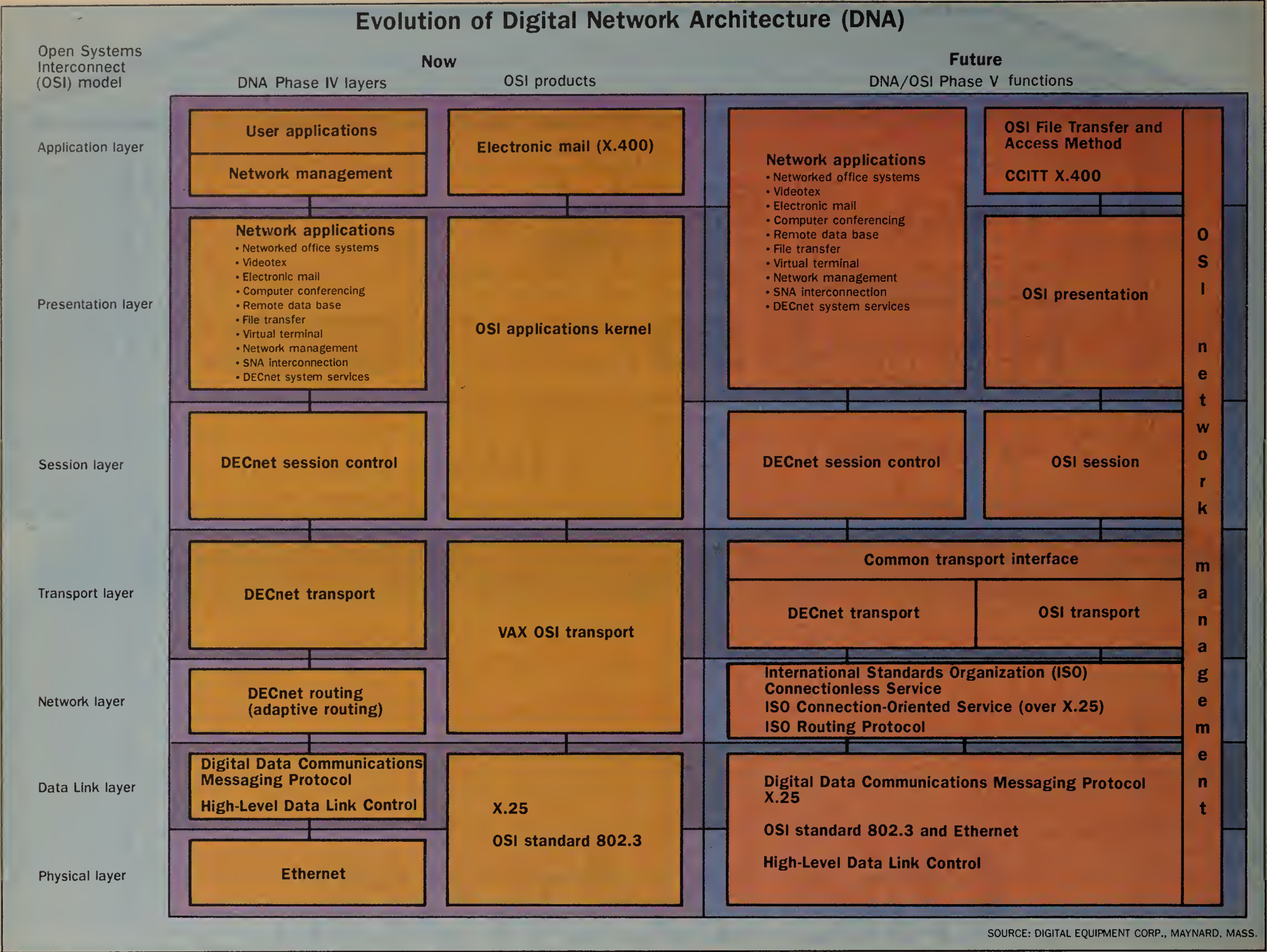
found VAX solutions that make it more effective for management to deal with engineering, the plants and other businesses units, because the communications are DEC-to-DEC," Shrednick says.

Beyond "one" strategy

DEC's "one" strategy, with its focus on networking, has helped the company stand out from the vendor pack. But there's no doubt that DEC's traditional Digital Network Architecture (DNA), served up now as a fixed offering, (see diagram on next page) will present as many alternatives as a Chinese menu, once DEC migrates to full conformance with standards based

Continued on next page





From previous page
on the Open Systems Interconnect (OSI) model.

Some observers say that even now DEC doesn't offer one solution. "DEC has to support Unix, TCP/IP, OSI — that's not 'one,'" says George Colony, president of Forrester Research, Inc. in Cambridge, Mass. "The 'oneness' strategy has worked, but it will become a wall around DEC. It's impossible to have this strategy and be open."

DEC announced its intention to migrate to OSI in 1985; full compliance is scheduled for 1990 or 1991.

However, it's not yet clear whether all protocols at OSI Layers 3, 6 and 7 will reach full international standard status in time for DEC to meet its compliance timetable.

This fall, the company revealed what its network architecture, referred to as Phase V, will look like after the three-year OSI migration. In essence, DEC is taking DECnet and embedding OSI into it as a subset, according to Dave Korf, DEC's wide-area networks and systems marketing manager.

Phase V of DECnet will provide users with multiple options at each network protocol layer. At the upper networking layers, DEC will offer two paths: one based on its proprietary DECnet architecture and one based on OSI.

To date, DEC has offered a full

"DEC's stance [on open systems support] is to move toward standards that are agreed to in the industry and are international in scope. It's also necessary to tie into the proprietary standards that various vendors have. The key is you don't do all of them. You do the ones your customers say are really important, and you try to cover as many of them as possible.

"If you wait for the standards to be defined, the problem is that you're going to be late in providing functionality to your customers. You have to start with what architectures are presently there. Then you have to intuit where you think the standards are going and work aggressively to make them happen the way you want them to. In the meantime, you're offering products before they're standardized but which you would like to see standardized in the future."

*William Johnson
Vice-President
Distributed Systems
Digital Equipment Corp.*

set of OSI protocols, introduced in April 1986, as a product line separate from DECnet. An implementation of the X.400 electronic mail standard has been available since May of last year, and the company

recently announced it will provide File Transfer and Access Method (FTAM) software. DEC has already demonstrated FTAM, but Korf would only say that it will be available by the end of 1988.

DEC is supporting OSI "because that's the most rational way to proceed," says Robert Murray, group manager of networks and communications marketing at DEC. However, he notes that "our value added will still be in the elegance of our own DECnet, or DEC-to-DEC, connectivity."

Murray explains that an OSI-compliant vendor will be able to use the OSI portion of DECnet to communicate with DEC systems, and vice versa. DEC computers will continue to talk to each other via the proprietary DECnet. As more standards evolve, DECnet and DEC's upper layer OSI offerings will overlap more.

Korf explains that, even as it migrates to OSI, DEC will protect its customers' investment in hardware and software. In a Phase V network, customers will write additional code that will enable older user-developed applications, written for Phase IV DECnet, to determine when they need to talk to an OSI node, Korf says. The applications will then use the OSI protocols, Korf says.

DEC-to-DEC communications will automatically be identified in a Phase V network. Such connections will provide a higher degree of functionality because the two machines will be running the same operating system, Murray says. "We know that DEC-to-DEC com-

munications will always provide the best functionality and interoperability for our customers, and we'll continue to encourage them always to buy DEC systems," Murray adds.

Moving to OSI over three years gives DEC time "to see how the market is shaping up, to see how the standards bodies develop and how the conformance tests evolve," says George Newman, senior research analyst at International Data Corp. (IDC), a Framingham, Mass.-based market research firm. "DEC has to ease into it, but they're ahead of most vendors.

It will be a scary world for vendors when their OSI implementations put them on the same playing field, Newman says, and for that reason, they will maintain proprietary products as well as OSI products. "Vendors will always have more feature-rich communications software of their own than will be integrated within the OSI layers," he says.

TCP/IP opportunities missed?

At least one user wishes DEC would support more de facto standards today instead of focusing so intently on OSI in the long term.

DEC has long recognized the need to support de facto standards as well as international standards.

"It looks like DEC is going forward with OSI, but they've missed some opportunities by not supporting TCP/IP as a standard product," says Al Siegel, manager of the computing and telecommunications center at Battelle Memorial Institute, a scientific research and development firm in Columbus, Ohio.

DEC does support TCP/IP in its Ultrix version of the Unix operating system. However, Battelle isn't a Unix shop, so Siegel has had to look to third-party vendors Network Research Corp. and The Wolongong Group, Inc. for implementations of TCP/IP for the VAX VMS operating system.

"DEC will offer somebody else's product if you really push," Siegel noted. He originally began using TCP/IP as a way to tie DEC equipment into the Department of Defense's Advanced Research Projects Agency Network. Now that Siegel has TCP/IP in-house, he says he's evaluating it as a way to connect his DEC, IBM and Control Data Corp. computers. In most other respects, Siegel is a happy DEC user. "It's clear that DECnet is much less expensive to operate and maintain than an IBM network," Siegel says.

IDC's Newman observes, "Whatever the customer wants, DEC will

do. But that's not what they're going to push as their primary technology; they'll still push DEC proprietary networking as much as possible. But even though it's proprietary, it works well." Newman adds that DEC's commitment to its own technology is a by-product of the company's success. "The larger your installed base, the harder it is to dislodge you," he says.

DEC's healthy installed base of networks — the company estimates it has 100,000 DECnet licenses — poses some challenges as DEC migrates from the Ethernet technology developed by Xerox Corp. to industry standard 802.3. Although 802.3 is patterned closely after Ethernet, the two do not communicate.

Both technologies can coexist on the same cable, but each requires a different transceiver for attaching to an Ethernet cable, according to John Neumann, senior vice-president of Omnicom, Inc., a standards consulting firm in Vienna, Va. As a consequence, users migrating to 802.3 will have to replace their transceivers, "and that's not cheap," Neumann says. Several computer vendors, including Hewlett-Packard Co., already support 802.3. But to date, users haven't mixed and matched equipment from different vendors on the same network, so few problems have arisen, Neumann says.

Big Blue ties

DEC has long recognized the need to support de facto standards as well as international standards. And one ingredient for success for any computer vendor is the ability to tie into the IBM environment. Although DEC had offered links to IBM for some time, it integrated IBM connectivity into DECnet in 1983, according to Murray (see chart, this page).

Murray and other DEC officials are fond of quoting analysts who say DEC ties to IBM computers better than IBM does. However, several market analysts recently stated that DEC is falling behind other vendors, such as Wang Laboratories, Inc., HP and Data General Corp., in providing IBM connectivity. John McCarthy, director of the professional automation service at Forrester Research notes that users can't run a single 3270 line to a VAX as with Wang systems.

"That's a problem for DEC users in a distributed environment because they end up paying the cost of DEC's SNA Gateway or the cost of going through a gateway at some other site," McCarthy says. The latter solution can result in slow response times, he notes.

The high cost of DEC's SNA Gateway was one factor that prompted Reebok International Ltd. of Canton, Mass., to reconsider its predominant use of DEC equipment. Reebok recently purchased an IBM 3090 to handle high-volume transaction processing and evaluated DEC's IBM connections. These connections are "quite expensive, both the hardware and the software," says Robert Dutille, director of MIS at Reebok.

Continued on next page

Multivendor connectivity provided by Digital Equipment Corp.

DEC-to-IBM

Primary internetworking capabilities

- **DECnet/SNA Gateway** — provides network-to-network connection that allows VAX/VMS or MicroVAX/MicroVMS systems to access resources, programs and information within Systems Network Architecture networks. Also allows IBM 3270 display users within SNA to access DECnet-based VMS or MicroVMS resources.
- **VMS/SNA** — software product that allows VAX systems to participate in IBM SNA networks as PU 2 nodes.
- **DECnet/SNA Access Routines and Programming Interfaces** — required for both the DECnet/SNA Gateway and the VMS/SNA host to allow users to perform specific functions on IBM hosts in SNA networks. Used in conjunction with option packages such as 3270 terminal emulation.
- **Message Router/S Gateway** — allows IBM SNA Distribution Services mail users to exchange mail, final- and revisable-form documents and MS/DOS files with DEC mail users.

Optional internetworking capabilities

- **DECnet/SNA VMS 3270** — allows a VT200 terminal or other device operating in VT100-emulation mode to interact with programs on an IBM system.
- **DECnet/SNA VMS Remote Job Entry (RJE)** — allows VAX or MicroVAX systems to function as SNA/RJE workstations that can submit batch jobs to an IBM host and receive job output.
- **DECnet/SNA Data Transfer Facility** — provides bidirectional data transfer between an IBM MVS system in an SNA environment and one or more VAX/VMS systems on a DECnet network.
- **DECnet/SNA VMS DISOSS Document Exchange Facility** — allows VAX or MicroVAX systems to access both document distribution and library services provided by IBM's DISOSS/370. Communicates with the DISOSS host using IBM's Advanced Program-to-Program Communications and Document Interchange Architecture/Document Content Architecture protocols.
- **EDE with IBM DISOSS** — provides VAX and MicroVAX users of DEC's All-In-1 Office Menu software or DECdx/VMS access to the document library services of IBM DISOSS/370 product. Final- and revisable-form text are supported.
- **DECnet/SNA VMS Distributed Host Command Facility** — allows IBM 3270-class displays connected to an IBM host running the Host Command Facility program to access VAX/VMS systems via the DECnet/SNA Gateway.
- **DECnet/SNA VMS Printer Emulation** — allows VAX or MicroVMS systems to receive printable data from an IBM host-based application.
- **DECnet/SNA VMS Application Programming Interface** — supports different types of sessions between VMS or MicroVMS applications and applications running in an IBM host through support of LU 0 sessions.
- **DECnet/SNA VMS APPC/LU 6.2 Programming Interface** — allows program-to-program communications between transaction programs on an IBM host and those on a VAX or MicroVAX system. The APPC product is a set of subroutines that is called by VMS or MicroVMS programs acting as LU 6.2 transaction application programs.
- **DECnet/SNA VMS 3270 Data Streams Programming Interface** — allows users to develop programs that use LU 2 sessions to communicate with IBM application programs. For use with VMS or MicroVMS applications.
- **VAX/IBM Data Access** — allows integration of data from IBM mainframe data bases with VAX data bases. VAX or MicroVAX system and DECnet/SNA Gateway required.
- **DECnet/SNA TOPS-20 Access Products** — allows users on one or more DEC TOPS-20 systems to transfer data between a TOPS-20 system acting as an RJE workstation and IBM batch subsystems and to implement distributed application programs that run between TOPS-20 and IBM systems.

Terminal emulators

- **VAX 2780/3780 Protocol Emulator** — supports the synchronous line protocol used by an IBM 2780 or 3780 Remote Batch Terminal. For VAX and MicroVAX systems.
- **VAX 3271 Protocol Emulator** — enables VT100 users or personal computer users emulating a VT100 on a VAX/VMS or MicroVMS system to communicate interactively with application programs running on an IBM System 370 class host.
- **RSX-11 2780/3780 Emulator** — emulates the communications protocol of an IBM 2780 or 3780 terminal while running a user task on a suitably configured RSX-11M or RSX-11M-Plus system.
- **RSX-11/3271 Protocol Emulator** — enables VT100 or VT200 users on an RSX-11M or RSX-11M-Plus system to communicate interactively with application programs running on an IBM System 370 class host.
- **Micro/RSX 3271 Protocol Emulator** — enables supported DEC terminals and application programs to interact with IBM system application programs and system services that use Binary Synchronous Communications.
- **RSX-11M-Plus RJE/HASP Emulator** — performs standard functions of an IBM HASP RJE workstation, operating as tasks under the RSX-11M-Plus operating system.
- **RSX-11M/IAS RJE/HASP Emulator** — performs standard functions of an IBM HASP RJE workstation, operating as a set of tasks under the RSX-11M or IAS operating system.
- **TOPS-10 and TOPS-20 2780/3780 Emulator-Terminator** — performs both emulation to IBM hosts and termination to RJE workstations that communicate via 2780 and 3780 protocols.
- **Digital TOPS 2780/3780/HASP Products** — perform both emulation to IBM hosts and termination to RJE stations that communicate via 2780, 3780 and HASP Multileaving products.

DEC to other environments

DEC to Unix-based computers

- **DECnet-Ultrix** — includes a software gateway that allows DEC Ultrix-based systems to communicate with DEC and non-DEC systems that support the Department of Defense's Transmission Control Protocol/Internet Protocol. Features bidirectional file transfer, remote logon and mail correspondence.

DEC to Unisys Corp.

- **UN1004/RSX Protocol Emulator** — a PDP-11-based software package that communicates with Univac 1100 series computers or other computer systems using the Univac 1004 RMS-1 communications protocol.
- **VAX NTR Protocol Emulator** — allows a VAX/VMS system to communicate with a Univac 100 series or other computer system using Univac Nine Thousand Remote protocol.

DEC to Control Data Corp.

- **MUX200/VAX Protocol Emulator** — provides communications with a CDC 6000, Cyber series or other computer system using 200UT Mode 4A communications protocol.

DEC to Wang Laboratories, Inc.

- **EDE-W Document Exchange** — a software application that utilizes the VAX 2780/3780 Protocol Emulator to give VAX users of All-In-1 or DECdx/VMS the ability to send documents to a suitably equipped Wang Office Information System.

SOURCE: DIGITAL EQUIPMENT CORP. MAYNARD, MASS.

From previous page

Dutile says the SNA gateway hardware runs about \$30,000, and the software ranges from \$4,000 to \$10,000 per module. "The problem is that you only get about 24 usable screen emulations," says Dutile. "It may be cheaper to go with straight IBM communications," he notes.

In addition, Dutile says DEC's communications with the IBM System/36 and System/38 are "horrible." The key problem is that IBM's minicomputers expect to communicate on a hierarchical basis and aren't geared to the type of peer-to-peer communications DEC uses, Dutile says.

IBM provides several ways to tie the IBM System/36 and System/38 to its mainframes, including remote job entry, whereas communicating from a VAX to IBM's mid-size systems is an expensive option, he notes.

Although Dutile is now leaning toward IBM as his primary vendor, he acknowledges that DEC equipment helped Reebok grow from a \$60 million business in 1986 to a \$1.2 billion business today. "I don't think any other vendor would have allowed us to grow so easily," he says.

In response to user demand, DEC is expected to announce a new SNA gateway some time soon. DEC's Korf acknowledges that customers want more concurrent sessions and more than the two lines to IBM systems that the current gateway supports. He would not divulge when the new gateway might be rolled out.

Providing backwards compatibility is proving to be one stumbling block, Korf says. Moving from the current gateway's 16-bit architecture to a newer piece of hardware based on a 32-bit architecture "is not necessarily easy," Korf says. DEC is also trying to provide increased performance as well as more sessions and lines in the new gateway.

DEC's current SNA gateway is supported only under MVS and MVS-XA. Last April, DEC committed to supporting the gateway both in DOS and VM, Korf noted. He indicated such support was likely before next April.

DEC already offers a link to IBM's DISOSS, and it recently announced that a connection to IBM's SNA Distribution Services would be available in November. DEC has also promised a connection to IBM's Professional Office System, which could be available in the first quarter of 1988.

The company is holding off on supporting IBM's NetView, however. DEC is committed to providing an enterprisewide network management capability that includes both DEC and IBM computers, says William Johnson, vice-president of distributed systems. "If, in fact, NetView becomes a standard for managing those networks, then we will look at supporting it," Johnson says.

Beyond the blue horizon

DEC offers few connections to vendors other than IBM. The com-

pany generally maintains that it offers enough detail about its architecture to make it easy for third-party vendors to tie into DEC equipment. At least one DEC manager admits the company could do a better job of making documentation available, however.

Steve Wendler, DECnet OSI X.25 marketing manager, says DEC has been working on a program to supply more information for third parties looking to build networking products. "We have tons of documentation and programmers' work kits that we don't heavily market at the moment," he acknowledges. Wendler notes that DEC offers programmatic interfaces at all seven OSI layers.

From the standpoint of proprietary DECnet, DEC wants third parties to interface from the top layers, Korf says. He adds that both the networking systems and architecture have published interfaces, and a series of commands are provided for accessing the MVS operating system.

Virtual Microsystems, Inc. is one third-party vendor that has found DEC open to offering information. "As far as DECnet goes, there has been a tremendous amount of documentation and hooks of various kinds available, as well as classes," says Dave Saxby, vice-president of engineering for the Berkeley, Calif.-based company. Virtual Mi-

crosystems specializes in connecting personal computer local networks to VAX systems.

Closing the BI bus

Some third-party vendors disagree with DEC's claims of openness, however. "The information is there somewhere, you just don't get much help finding it," says one third-party vendor, who asked not to be named. The vendor was turned down by DEC for a license to DEC's VAX BI bus. Claiming that "DEC is making a concerted effort to prevent third parties from working on its equipment," he believes the license was turned down because DEC plans to offer a product similar to the one his company proposed.

DEC user Bill Brindley is generally complimentary of DEC and its products. He even characterizes DECnet as an open architecture. However, DEC's decision to license the BI bus "disappointed" him, says Brindley, director of computer systems technology for the Washington, D.C.-based Naval Security Group Command, which designs communications systems.

"There's an incredibly significant third-party group out there, and they've been influential in DEC's success," Brindley says. Third parties often force DEC to upgrade its own technology by providing more sophisticated products

than DEC's own, Brindley says. By restricting use of the BI bus, "third parties are not being allowed to play that role this time," he adds.

IDC's Newman says DEC hasn't wanted to open the BI bus because the company is looking to sell its own peripherals and add-on products to its customers. Some in the industry think DEC's attitude could change. "I have no doubt that after IBM's coming onslaught against DEC, when DEC has a harder time, they'll once again look to third parties as allies," says the unnamed third-party vendor.

Indeed, users and analysts alike suggest that DEC shouldn't let its current success go to its head. While DEC solves Corning Glass' problems today, they may not five years from now, Shrednick says. "My feeling is that, five years out, IBM will be a major force to contend with throughout the entire line — from workstations on up to the supercomputer," Shrednick says.

IDC's Newman says, "DEC has got to be careful." Quoting from a recent report he wrote on the company, Newman concludes that "DEC must work even harder over the next five years and not revel in these prosperous times."

DEC may be feeling its oats now, but a lot can change between youth and middle age. □

DEC embraces PC connectivity but shuts out Token-Ring

Digital Equipment Corp. is serious about beefing up its personal computer networking. So says Bill Johnson, vice-president of distributed systems.

DEC has demonstrated just how serious it is by throwing in VAX/VMS Services for MS-DOS with each DECnet license for its VAXes. The new software bundling became effective in September, even though the VAX/VMS Services product only began shipping in June, according to Joanne Correia, personal computer interconnect marketing manager.

The product's original pricing — from \$3,900 for the MicroVAX version to \$19,500 for the VAX 8800 version — apparently daunted potential users. "DEC had some fairly stiff prices on it," notes Al Siegel, manager of the Computing and Telecommunications Center at Battelle Memorial Institute in Columbus, Ohio.

Siegel says he thinks DEC has taken the right approach with personal computer connectivity, however. He says he's impressed with VAX/VMS Services, which allows DEC machines from the VAXMate on up to act as file, print and mail servers for personal computers.

Weyerhaeuser Co.'s Bob Lovestadt, by contrast, opted for a product called Remote Access Facility (RAF) from Datability Software Systems, Inc. in New York

to tie personal computers to a DEC cluster. "We tested five products, including other non-DEC products, and we felt RAF had much more functionality and was a better match for our environment," says Lovestadt, the firm's scientific computing operations manager. RAF's printer emulation set it apart from other products, he notes.

While VAX/VMS Services is positioned to compete against local network vendors such as Novell, Inc., DEC's first personal computer product, DECnet DOS, is aimed at developers, Correia says. DECnet DOS provides virtual disk, file and print functions. With it, developers can build programs that run between a personal computer and a VAX using DECnet protocols.

DECnet DOS "is pure DECnet for MS-DOS machines," Correia explains. VAX/VMS Services are layered on top of DECnet DOS and have Microsoft Corp.'s MS-Networks layered on top of them. As a result, personal computers with VAX/VMS Services can run applications that support MS-Networks. DEC plans to add support for IBM's Network Basic I/O System in early 1988, Correia says. "We'll take the NETBIOS packets and turn them into DECnet packets," she adds.

Analyst John McCarthy says he thinks DEC is "completely

missing the boat with its PC strategy." DEC should recognize that personal computer users crave control over their machines and not try to push the VAX down to the workstation level, says McCarthy, director of the professional automation service at Forrester Research in Cambridge, Mass.

"Novell talks about its PC-centric view of the universe. For [DEC President Ken] Olsen, it's VAX-centric," McCarthy says.

Indeed, DEC maintains a stubborn commitment to its chosen technologies, including Ethernet. "As Ken [Olsen] would say, Ethernet is our manifest destiny," says Dave Korf, wide-area networks and systems marketing manager. And despite its commitment to provide connectivity to the IBM environment, DEC is not planning to support Token-Ring networks, not even to bridge to them, Korf says.

Ethernet "is a mature, reliable technology," while Token-Ring is not, Korf maintains. "Token-Ring hardware is just becoming available. It has not necessarily been proven in large networks. The applications and the tools have not been developed." For DEC to support Token-Ring, "it has to become demanded by our customers and economically feasible, as well as stable," Korf concludes.

— Mary Petrosky

Letters:

Editor:

The title of John Hunter's Product Focus in the Oct. 5 issue of *Network World*, "Bridges, gateways open to confusion," is an accurate assessment of this segment of the network market. While this article is generally accurate and useful, some information on bridges adds to the confusion.

Hunter failed to acknowledge the different ways in which bridge vendors specify filtering and forwarding rates for their products, leading to potentially misleading comparisons. Many vendors specify "total" rates, meaning that the individual rates for each network connection are combined into a single number. Thus the Digital Equipment Corp. LAN Bridge 100 can boast a filtering rate of 24,272 frame/sec when the maximum rate physically possible on an Ethernet local-area network is only 14,880 frame/sec. Other vendors, including Netways, Inc., specify the rates individually for each network connection, providing a more accurate view of how the bridge will perform on the connected local networks.

Because of these differences, some bridges in the table on page 38 appear to be higher in performance, but are significantly lower. For comparison purposes, individual rates can be doubled when compared to the "combined" rates, although it's not always that simple, particularly when evaluating forwarding rates.

Other important considerations include whether the specified rates are for bursty or sustained traffic, what frame size was used in specifying the rates, and what speed was used for the remote link in remote bridge applications. The frame size used for specification is typically 64 bytes (the minimum Ethernet and IEEE 802.3 size), not 763 bytes as stated in the article.

In fact, the maximum frame rate physically possible on a 10M bit/sec Ethernet with 763-byte frames is only 1,612 frame/sec, as opposed to 14,880 frame/sec for 64-byte frames.

As an example, the Netways Bridge/Plus specifies a 14,880 frame/sec burst receiving rate, a 7,500 frame/sec sustained filtering rate and a 5,000 frame/sec sustained forwarding rate per network connection. If these were specified as "total" rates, they would be 29,760 frame/sec, 15,000 frame/sec and nearly 7,000 frame/sec respectively. Minimum size (64-byte) frames are assumed.

If remote Bridge/Plus units are used with a T-1 link, the forwarding rate drops to about

2,800 frame/sec, with the T-1 speed of 1.544M bit/sec as the limiting factor. Wary bridge users should find out exactly what a vendor's specifications mean. They should keep in mind what the physical realities of the local net are, how their networks are used in terms of average frame size and bandwidth utilization, the flexibility required by the application and the price they are willing to pay.

Robert J. Gohn
Staff engineer
Netways, Inc.

I agree with Gohn's comments concerning how filter rates should be specified, and this is what all the vendors in this survey said their figures were based on.

Rarely will any packet be completely filled or be the minimum size Gohn indicates. Since none of the vendors surveyed could offer a statistical average for the number of bytes per packet, it was agreed that a half-filled packet would probably be representative of the size generated.

The packets filtered and packets forwarded numbers in the chart reflect the 763 byte numbers for Ethernet packets and 1,000 bytes for Token-Ring packets, as was stated in my article. When those numbers appeared out of line, the vendors were questioned and they stated that their products were capable of such performance.

John Hunter

Editor:

The Opinion column, "Users need T-1 benchmark," in the Sept. 14 issue of *Network World* implies that bit-interleaved multiplexers can provide better utilization than byte-interleaved units. As the old saying goes, "There's no free lunch," and there's a downside to bit-interleaving in terms of error performance.

Most carriers know that errors in digital transport systems (cable, microwave, lightguide) aren't steady state but come in short bursts. Typically, a properly engineered T-1 transport system will perform error free for many hours or days. Errors generally occur in short bursts. This phenomenon was publicly recognized by the Bell System in the mid-1970s by using Error Free Seconds (EFS) as the measurement of quality on Dataphone Digital Service circuits. Studies have also shown that the average burst is less than one frame (8,000 frames per second) in length and that byte interleaving will provide better performance for individual circuits than bit interleaving, since a burst will affect fewer circuits.

Bell System tariffs for 56K bit/sec Dataphone Digital Service circuits quoted 99.5% EFS, whereas 1.5M bit/sec was quoted at 95% EFS. Since both

of these services were affected by the same types of error performance on transport systems, the difference is in the average length of the bursts.

I fully agree that benchmarks are needed for T-1 multiplexers and other terminals. One of the benchmarks should measure the ability to minimize the impact of error bursts on end users.

Another important T-1 benchmark is compatibility with the Extended Superframe Format (ESF). This format was proposed by the Bell System in 1980 as the next evolution after the D4 Framing format. A major advantage of ESF is the capability to provide nonintrusive measurements of the quality of T-1 transmission paths over their entire length, regardless of transport technologies.

Additionally, ESF can also provide a nonintrusive method of localizing the causes of errors to a specific transport system. This is particularly important in locating the causes of error bursts, which may be present only for very short periods. A number of vendors and carriers are deploying ESF capabilities in their products and services, which should allow these products and services to function together more effectively.

Robert J. Armstrong
Martinsville, N.J.

Editor:

In the debate over Link Access Protocol D vs. the Microcom Networking Protocol ("MNP vs. LAP D," Aug. 31) as the standard error-control modem protocol, Gregory Pearson gave valid reasons for the Consultative Committee on International Telephony and Telegraphy to adopt MNP as the standard. On the other hand, Fred Burg offered only superficial reasons for LAP D.

Burg's statement that using the currently installed base of MNP modems and communications suppliers is not a valid indication that MNP is justified as the standard is absurd. That's like saying no one else should open a hamburger stand just because McDonald's is successful.

Burg also stated that "LAP D [has] been proven logically correct." MNP can make the same boast, as can many other entities, none of which is concerned with communications of any type.

He goes on to say "LAP D is better than MNP in some environments and performs about the same in others." Again, MNP can make the same claim.

As for future communications needs and the need for a standard protocol to change with them, MNP can be adapted to these needs just as easily as LAP D.

LAP D's descent from High-Level Data Link Control is beneficial, but where is the installed base of products and users that

shows industrywide acceptance of LAP D?

That many modem manufacturers and communications service providers support MNP is a valid reason for MNP to be adopted as the error-control standard. But there's another reason both Pearson and Burg missed. To be a valid standard, the protocol should be placed entirely in the public domain. MNP's highest level implementations are available to any modem manufacturer that pays a licensing fee to Microcom, Inc.

I'm for MNP and hope that, when all is said and done, MNP will arise as the standard error-control modem protocol.

Richard Curry
Columbus, Ohio

Contrary to Curry's beliefs, the case for MNP wasn't one of technical superiority over LAP D. The only argument in favor of MNP involved its installed base.

Performance-wise, there was no claim that MNP was superior in any environment. While both LAP D and MNP are said to be proven logically correct, the proof for LAP D has been agreed to by international experts involved in the standards-making process and is part of the LAP D standard. The proof for MNP was done by a few UK experts and was never presented at the meetings. The UK experts stated that the work had uncovered a number of concerns, and the UK supported the LAP D approach.

MNP didn't meet all of the standards group's requirements; LAP D did. While MNP no doubt could be enhanced, doing so would, at worst, make new MNP modems incompatible with the installed base or, at best, render their new features useless for communicating with the installed base.

Acceptance of LAP D is not industrywide. Further, the point I made in support of LAP D is that, as a descendant of HDLC, it shares many characteristics with other descendants. The basic application in question is error control on point-to-point analog links. LAP B has been used in this application longer than MNP, and its acceptance is far more widespread.

Finally, some question whether paying a license fee for the right to use MNP constitutes public domain availability. Certainly, no standards-making organization would agree to such a definition, especially given an alternative of equal or better functionality that's free.

No one's trying to prohibit others from opening hamburger stands just because of McDonald's success. But what if one tried to say the McDonald's hamburger was the standard?

Fred Burg

Letters may be edited for space and clarity.

GSA to divvy up FTS 2000

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Under the GSA's new guidelines, a draft request for proposal will be issued Dec. 1 to current and potential bidders for their review. A final RFP will be released on Jan. 1, 1988. Bids will be accepted March 30, and awards will be announced Sept. 30.

Under the original RFP, issued in January 1987, bids would have been due last June, and an award would have been announced this December. That schedule was changed and moved forward several times due to problems with the RFP.

FTS 2000 is one of the largest, most complicated and controversial government procurements in history. The FTS 2000 contract requires construction of a nationwide integrated telecommunications network to provide 1.3 million federal employees with state-of-the-art communications services. FTS 2000 is expected to save the government \$100 million per year over the current FTS government network.

Rep. Jack Brooks, chairman of

the House Operations Committee, was one of the most ardent critics of the GSA's plan to award a single, 10-year contract to a prime contractor. Brooks recommended splitting the FTS 2000 contract on a 70%-30% revenue basis, for a four-year term.

Congressional criticism forced the GSA to halt FTS bidding in September, in order to devise a new strategy that would satisfy demands for more competition in the procurement. By having two winners, critics such as Brooks reasoned, there would be constant competition throughout the life of the contract.

The GSA consulted with members of the House of Representatives Government Operations Com-

mittee and the Senate Government Affairs Committee before restructuring the procurement, according to Fisher.

Both FTS 2000 bidders, company teams led by AT&T and Martin Marietta Corp., have also been apprised of the proposed changes. "All the necessary parties were consulted before we announced our new strategy," said GSA's Fisher, "and I don't think any of the parties have any problems with the new FTS 2000 plan."

AT&T spokeswoman Edith Herman said AT&T does not oppose the division of the FTS contract between two prime contractors. In an earlier statement, Louis Golm, AT&T's vice-president of federal systems, said, "We strongly en-

dorse Chairman Brooks' concept of a multivendor, continuous competition solution."

Both AT&T and Martin Marietta said they wanted to study the new RFP before commenting further on the changes.

Electronic Data Systems Corp. (EDS), which recently announced it may re-enter the FTS competition as a result of the changes, said it would not make a final decision until officials have a chance to review the actual RFP, according to spokesman Mark Fox.

EDS originally teamed up with US Sprint Communications Corp. to bid on FTS 2000 but pulled out of the fray in June after the RFP was delayed on numerous occasions. □

Getting a VSAT network d

Taking risks can be an important part of doing business. But it shouldn't be part of choosing a communications system.

That's why our AT&T SKYNET® Star Network Service offers your business something you won't find in most

other VSAT systems: reliability. And that becomes very evident when you consider that our service

AT&T comes through with SKYNET Star Network Service.

has the highest system uptime in the industry.

Our service is completely flexible because it's software-defined. Which puts a powerful network management system at your control—allowing you to change the network as quickly and as easily as possible. You can also choose from one of, or a combination of, three different network configurations: two-way data, one-way video or one-way data.

Say, for instance, a hotel chain needs to check room availabilities and confirm reservations between a central office and more than 200 different locations. By using two-way data transmission, they can transmit packetized information at user data speeds of up to 9.6 kbps. Sending information this way is not only incredibly efficient, it's virtually error-free.

With one-way video transmission, you can send high-quality video and associated sound to standard TV monitors without using any special equipment to get a perfect picture.

One-way data lets you expand your digital broadcast network—transmitting data even in areas where terrestrial digital facilities aren't available.

Our SKYNET Star Network Service is also cost-effective. You can lock in end-to-end service rates for variable lengths of time. Also VSATs are compact, which means they're relatively inexpensive to install and maintain. And they serve multiple applications by transmitting fax, video, and data simultaneously.

Yet, when it comes down to it, the most important part of our SKYNET Star Network Service is our AT&T people—people who are available to offer their expertise in data communications, network management,



satellite engineering capabilities, and management of earth-to-satellite links. They'll work with you to customize a Star Network solution that works best for your business.

And, most importantly, they'll make sure it's not risky business.

For more information about AT&T SKYNET

NY on hunt for statewide T-1 net

continued from page 4

"We bought 32,000 lines of service for approximately \$25 million dollars with no money down, to be paid back in five years," Heinsohn said. "We're providing our own switches and station apparatus, whereas, before divestiture, we paid New York Telephone for switching services and had to pay AT&T for station hardware. Now we own it all."

With CAPNET, the state has bypassed the local telephone company except for local calls, according to Heinsohn. Users can call extensions within the 59 buildings in Albany using five digits. "We wanted to get away from leased transmission facilities."

The state wanted control over transmission facilities "because that's one of the areas of explosive cost escalations," he added. With CAPNET, the state has achieved its goal of eliminating the local loop, Heinsohn noted.

He added that another reason the state opted for its own network was to take advantage of advanced technologies. Already, CAPNET is being used by the state's department of higher education to transmit educational television programs. And the ISN packet network, which was cut over in early November, is serving 2,400 users, Heinsohn said.

Each telephone outlet in the state buildings in Albany has been wired with four pairs of telephone-type wire. One pair is dedicated to the packet-switching network, and either one or two pairs are used to support the telephone set, depending on whether the set is analog or digital. The fourth pair is a spare. "We just call it an information outlet," Heinsohn said. □

Novell widens NetWare

continued from page 2

NetWare beginning with SFT (System Fault Tolerant) NetWare 2.1. This initial implementation is due out by year's end, with support for Btrieve in Advanced NetWare Level II and Entry Level Solution NetWare Level II slated for first quarter 1988.

The Btrieve code for NetWare will be divided into two parts: a data-access front end called the Btrieve Requester that resides on the workstation and a back end, called the Btrieve Record Manager, that resides on the server. There will be no extra charge for Btrieve support.

Oracle is working with Novell to modify Oracle's personal computer-based data base management products so they can run on a NetWare-based local net. Oracle's relational DBMS, Oracle, was originally available on larger computers. Today, versions of Oracle run on IBM mainframes, mid-sized systems from companies such as Digital Equipment Corp., Hewlett-Packard Co. and AT&T, as well as on microcomputers.

Oracle currently offers three personal computer-based products. Professional Oracle is a stand-alone DBMS, which offers a networking option. LANserver Oracle, due to ship by year's end, allows a data base kernel, or core, to reside on a server; LANserver is

currently based on Xenix. Networkstation Oracle provides a user front end, including forms and report generation, and is networked to either the LANserver or a host computer running the Oracle data base kernel.

Users will have options for allowing Oracle's personal computer-based products to run on NetWare-based networks and access NetWare-based servers. Since the LANserver will initially support Transmission Control Protocol/Internet Protocol, it will be accessible via Novell's NetWare TCP Gateway. Users also have the option of outfitting networked workstations with an Ethernet interface card jointly developed by Excelan, Inc. and Novell. □

LAN wares steal show

continued from page 2

The new version also enables multiple Usernet2s to be linked via bridges and enables a network-attached personal computer to collect Usernet2 usage data.

Usernet2 will be available early in 1988. Pricing is not yet set.

Attempting to crack the business marketplace, Sunnyvale, Calif.-based video game maker Atari Corp. announced it will resell Los Gatos, Calif.-based Moses Computers' twisted-pair wire PromiseLAN local network adapter boards. The boards support IBM's Network Basic I/O System as well as IBM's PC LAN operating system.

With PromiseLAN, an IBM Personal Computer AT or compatible — including Atari's PC4, which was also released here — acts as the hub of a star-configured net supporting up to 17 IBM Personal Computers, each of which can be up to 1,000 feet away. Each PromiseLAN hub board can support up to four RJ-11 ports. Hub boards communicate with slave adapter boards installed in each personal computer at up to 1M bit/sec.

A starter kit linking two personal computers is \$375, and each slave adapter board is \$150.

Atari said it will also develop PromiseLAN adapter boards for its Mega and ST microcomputers.

Waterloo Microsystems of Waterloo, Ontario, released Version 2.41 of its Port local network operating system. The Port operating system runs on IBM Personal Computer ATs and Personal System/2s outfitted with a Port Network Interface Card or an IBM Token-Ring Adapter.

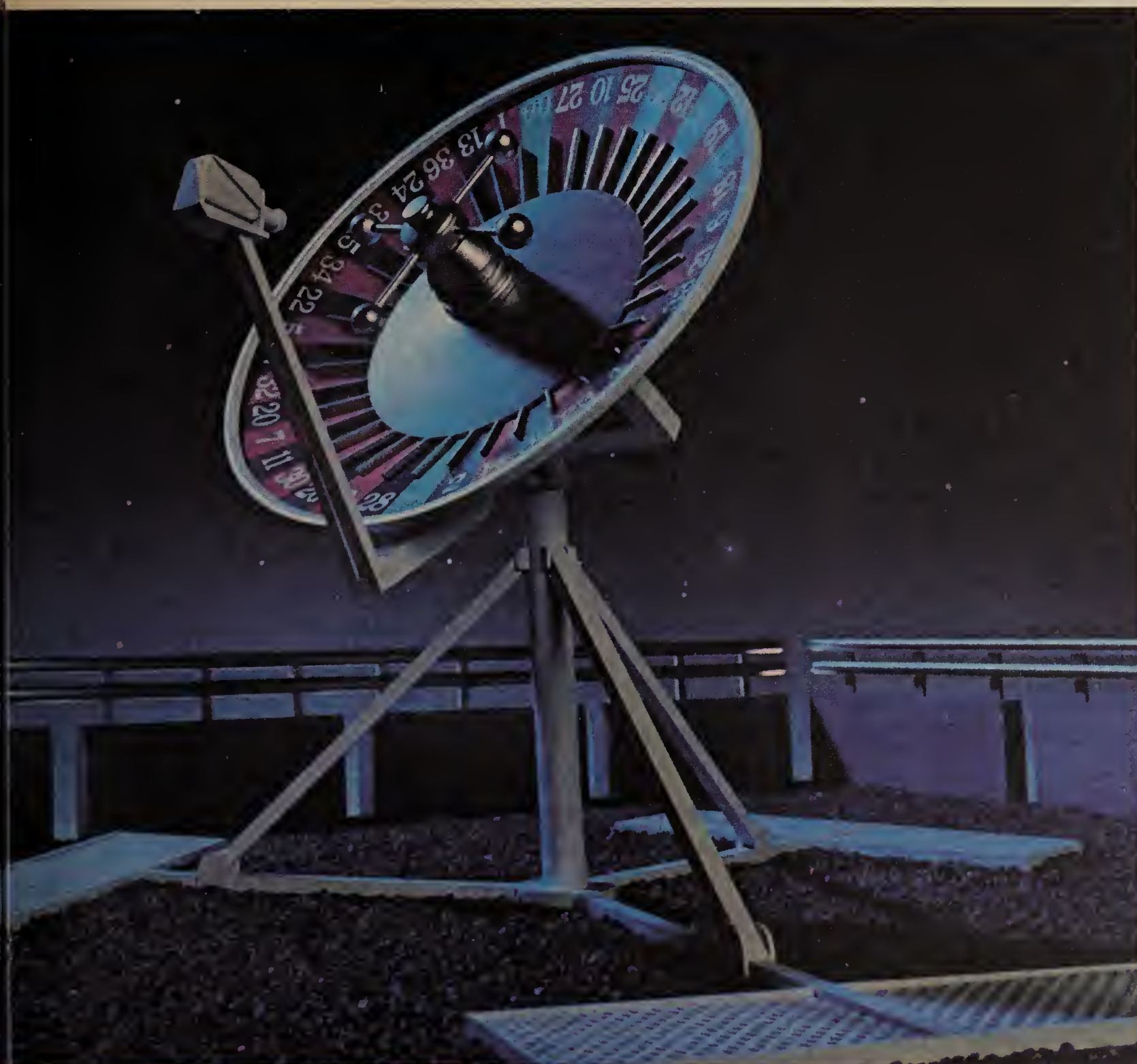
Port Version 2.41 includes support for the firm's new Gatekeeper software, which enables a Port system administrator to implement security measures on Waterloo's set of software gateway products.

Gatekeeper software runs in conjunction with Waterloo's series of software-based internetworking products that link a Port-attached device to another Port device on a remote network. Those internetwork products include Port Remote Workstation, Port Backbone Internet Gateway, Port Asynchronous Internet Gateway, Port X.25 Server and Port X.25 Point-to-Point Server. Those existing products range from \$295 to \$2,995.

With Gatekeeper software, the firm's internet gateway products can be configured to require a password before a user can gain access to another net. Gatekeeper software also supports management functions that enable administrators to configure an internetwork product to prevent a Port user from gaining access to a gateway, a specific remote net device or remote files. Available in December, Port 2.41 will cost \$2,495.

DSC Nestar Systems, Inc. of Mountain View, Calif., announced its PlanStar file server will now support an Ethernet connection. The firm's PlanStar file servers already support connections to token-ring and ARCnet-type nets. □

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Management Updates:

- * January 4 - Negotiating with Vendors (Early close due to Holiday)
- * February 1 - Developing Your Management Style
- * March 7 - The Network as a Profit Center
- * April 4 - Managing Consultants

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- * January 11 - T-1 Multiplexers (Early close due to Holiday)
- * February 8 - Modems (below 9600 bps)
- * March 14 - Network Management and Test Equipment

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PC Buyer's Guides:

- * January 25 - Microcomputer Communications Software
- * February 22 - Ethernet LANS
- * March 28 - Micro-to-host Links

Industry Focuses:

- * February 29 - Government

Editorial Show Coverage:

- * January 18 - CN Preview Issue (Early close due to Holiday)
- * January 25 - Communication Networks (CN) Show Issue (Bonus Show Distribution)
- * February 1 - CN Wrap-Up Issue
- * March 21 - Interface Preview Issue
- * March 28 - Interface Show Issue (Bonus Show Distribution)
- * March 28 - World Congress on Computing (WCC) Show Issue (Bonus Show Distribution)
- * April 4 - Interface Wrap-up Issue

NETWORK WORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. The November 30th issue will be closing November 20th. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone.

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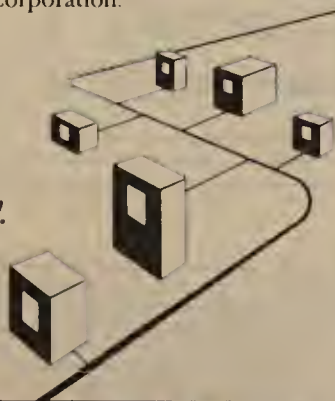
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IBM details OS/2 support plans

continued from page 1

of supporting multiple tasks that communicate with each other. This allows users to run applications in the background while working on one application in the foreground. This communications capability makes it easier to network OS/2-based personal computers than MS-DOS-based microcomputers, which are single-tasking.

Both IBM and Microsoft will begin shipping OS/2 1.0 in December, slightly ahead of schedule. Microsoft's OS/2-related networking software, LAN Manager, is due to ship to computer and software vendors in the first quarter of 1988. IBM has licensed both OS/2 and the LAN Manager from Microsoft but has opted to use only selected portions of the LAN Manager to develop its own local networking products.

IBM last week also announced shipment dates for its full range of OS/2-related products, as well as availability of the 3270 Workstation Program. Most of these products were previously announced by IBM without shipment dates and will now be available between July and November of 1988.

OS/2 runs on IBM Personal Computer ATs and compatibles, the IBM XT Model 286 and the Personal System/2 Models 50, 60 and 80. IBM will be rolling out its OS/2 products as follows:

■ Standard Edition 1.0 will ship in December. This version supports up to 16M bytes of memory and allows users to run multiple concurrent applications. The one-time license charge is \$325.

■ OS/2 Standard Edition 1.1, to ship in October 1988, includes all the features of Standard Edition 1.0 plus a graphics-based Presenta-

tion Manager program. Presentation Manager provides windowing capabilities. Licensees of Standard Edition 1.0 can obtain a replacement copy of 1.1 at no charge.

■ OS/2 Extended Edition 1.0, to ship in July 1988, has a relational Database Manager and a Communications Manager developed by IBM. The Communications Manager provides terminal emulation and intersystem communications; the latter allows customers to use information residing on other personal, mini- or mainframe computers. The one-time license charge for the Extended Edition is \$795.

■ OS/2 Extended Edition 1.1, to ship in November 1988, includes the features of Extended Edition 1.0, plus the Presentation Manager and local network support. Such support is provided, in part, through the Communications Manager. Licensees of Extended Edition 1.0 can obtain 1.1 at no cost.

■ IBM OS/2 LAN Server 1.0 is built on the OS/2 Extended Edition and provides file, printer and general resource sharing on a local network. The LAN Server supports workstations on Token-Ring and PC Networks running either the Extended Edition 1.1 or PC DOS. The LAN Server includes security services, printer management, status reporting services for audit trailing and administration facilities for centrally controlling LAN resources. The LAN Server Version 1.0 has a license charge of \$995.

■ IBM PC LAN Program Version 1.3, due for delivery in July 1988, is a new release of the PC LAN Program for PC-DOS users. It offers network administrators additional control of network resources. Network workstations running the PC LAN Program 1.3 can access the LAN Server. The one-time license charge for PC LAN Program 1.3 is \$225. Current

PC LAN Program users can upgrade from Version 1.2 for \$90.

Although IBM and Microsoft have worked closely to ensure that their OS/2 offerings are essentially the same, IBM's networking products will differ from Microsoft's. IBM has licensed both OS/2 and the LAN Manager from Microsoft but will not implement the full LAN Manager functionality, according to Mike O'Dell, IBM's product manager for Personal Computer local-area network systems. IBM will also implement the Communications Manager, which is not part of Microsoft's OS/2 offerings.

IBM and Microsoft do share several key network pieces, however, O'Dell said. Both companies will support Network Basic I/O System and the OS/2 versions of the Redirector and Server-Message Block (SMB) protocols, which were first used in Microsoft's MS-Networks, a network operating system for DOS.

The Redirector is code that resides on so-called network "client" nodes and communicates with a network server. IBM also calls this code the Requester. SMB protocols provide file and print service between client nodes and a server.

Unlike Microsoft, IBM uses the Communications Manager in its LAN Server, which gives it an inherent capability to support gateways to other computer environments, O'Dell said. In addition, IBM's networking software will employ a different user interface than Microsoft's LAN Manager, according to O'Dell. IBM is also developing its own network administration and security utilities, he said.

O'Dell and Microsoft's vice-president of system software, Steve Ballmer, agree, however, that applications written simply to OS/2 will run in both the IBM network environment and Microsoft LAN Manager-based environments. ■

CALENDAR

Nov. 11-13, Los Angeles — Localnet '87. Contact: Conference Management Corp., Box 4990, 200 Connecticut Ave., Norwalk, Conn. 06856.

Nov. 11-13, Boston — Understanding Systems Network Architecture: Advanced Networking Architectures. Contact: Communications Solutions, Inc., 2125 Hamilton Ave., San Jose, Calif. 95125.

Nov. 12-13, Washington, D.C. — Next Generation Network Switches: Understanding How Tomorrow's Network Architectures Will Impact Your Business. Contact: BCR Enterprises, Inc., 950 York Road, Hinsdale, Ill. 60521.

Nov. 15-18, Orlando, Fla. — Telecommunications: A Strategic Resource. Contact: Southeastern Telecommunications Association, P.O. Box 901, Richmond, Va. 23207.

Nov. 16-18, San Francisco — IBM's Token-Ring Network: Understanding and Implementation. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Nov. 17-20, Los Angeles — Computer-Aided Tools for Software Analysis and Design. Contact: John Valenti, Integrated Computer Systems, 5800 Hannum Ave., Culver City, Calif. 90231.

Dec. 2-4, Los Angeles — Hands-On Personal Computer Networking. Contact: John Valenti, Integrated Computer Systems, 5800 Hannum Ave., Culver City, Calif. 90231.

Dec. 3, Gaithersburg, Md. — Information Resources Management: Standards for Future Information Systems. Contact: Arlene Carlton, National Bureau of Standards, Building 225, Room B151, Gaithersburg, Md. 20899.

Dec. 8-9, New York — Communications Opportunities Strategy Conference. Contact: Quantum Consultants, Inc., 1114 Avenue of the Americas, New York, N.Y. 10036.

Dec. 9-10, New York — Integrated Services Digital Network Applications and Market Forecasts. Contact: Mark Ricca, The Eastern Management Group, 4 Century Drive, Parsippany, N.J. 07054.

Dec. 10-11, Piscataway, N.J. — Local-Area Networks: Concepts and Components. Contact: CCN Associates, 127 Park Ave., Maplewood, N.J. 07040.

Dec. 16-18, New York — 1987 Microcomputer Graphics Show and Conference. Contact: Susan Werlinich, Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

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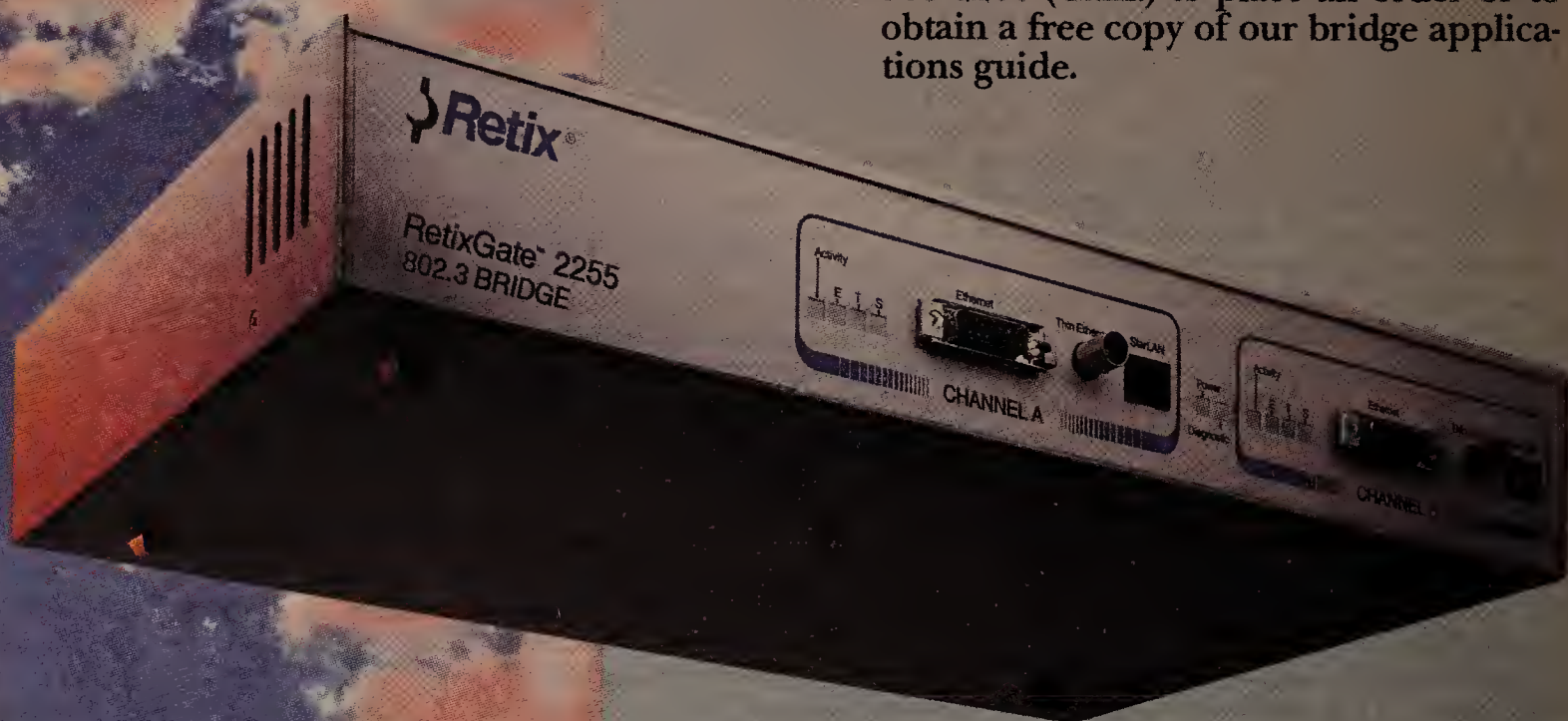
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